

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—25TH YEAR.

SYDNEY, SATURDAY, APRIL 23, 1938.

No. 17.

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An Address.¹

By B. T. EDYE, M.B., Ch.M. (Sydney), F.R.C.S. (England), F.R.A.C.S.,

President of the New South Wales Branch of the British Medical Association.

I AM deeply conscious of the honour you have bestowed upon me this evening in selecting me as your President for the ensuing year, and I am grateful for your trust. I anticipate the task ahead will not be easy; it will be time-consuming and may be fraught with difficulties. Many distinguished names appear in the list of the past-presidents of this Branch of the British Medical Association, and I cannot but feel the weight of the responsibility

¹Delivered at the annual meeting of the New South Wales Branch of the British Medical Association on March 24, 1938.

I am assuming tonight. However, I am able to face the year confidently, knowing that I shall have the sympathetic support of a representative and enthusiastic council and the loyal assistance of a competent and highly experienced staff.

I should like here to record, and I am sure I voice the feeling of all members, an appreciation of our retiring president, Dr. Lindsay Dey. He has completed an arduous year in a thoroughly conscientious manner, and he has maintained the high standard set by former occupants of the presidential chair. I shall be happy indeed if, at the end of this year, I can feel that I have accomplished as much as Dr. Dey.

When the present anniversary celebrations began, a Minister of the Crown said, not without truth: "We provide our guests with nice menus and good food and then proceed to talk them to death." A glance round this hall will convince you that you

need expect nothing in the way of a "nice menu" tonight, and I can assure you that I have no intention of using words as lethal weapons.

The picturesque pageantry which has taken place here during the past few weeks, in which the early history of our country has been commemorated and reviewed, has led me to think of all that our early doctors achieved, not merely as practitioners, but as citizens who directed their energies into channels other than the professional, to the lasting advantage of Australia.

A belief has long been current that doctors, with few exceptions, are interested in nothing but professional matters, given to talking of little but "shop", and somewhat restricted and narrow-minded in their outlook. That generalization is untrue; for there is no set of men or women—consider any profession you choose—with a greater diversity of interests. There have been many large-minded medical men in Australia, men who not only practised their profession well, but have helped to develop our resources, establish industries and make our history; and so our present celebrations lead us very appropriately to consider the part which these medical men have played as administrators, law-givers, statesmen, explorers and builders. Reading an old number of *THE MEDICAL JOURNAL OF AUSTRALIA* I saw the following: "Politics and medicine do not mix." If by the word "politics" you imply some evil infusion of political adroitness, lobbying or vote-hunting, then this dogma may be true. But we do not exaggerate when we say that medicine and statesmanship and medicine and governorship may mix very well indeed.

There have been many men of medicine in Australia who have devoted themselves to the public good, doctors whose names, we hope, will be increasingly honoured as time passes. The story of their lives and deeds has been admirably set down by our own native historians of medicine. In reading the accounts of these dead-and-gone stalwarts of our profession, we have to remember today that they were new-comers in a strange country. For the most part no rewards, save in the way of land grants, could be acquired by them. They had to conquer the country and make their living out of it, and, faced with such difficulties, they not only established the profession of medicine upon an honourable and ethical basis, but by their extra-professional work they improved their own lot and that of their fellow citizens socially and economically. Many of them were men of culture and had a sound knowledge of the liberal arts and of the sciences; they were interested in something more than "shop". Even the rather testy and dour John White, the surgeon-general of the first fleet, who loathed this country and everything in it, and who never mentioned it except with curses, even John White went botanizing. For he sent a very worthy collection of native plants back to England, and with Denis Conisden at his elbow, he and this junior colleague of the first fleet extracted the

essential oils of certain eucalypts and used them to treat their patients.

An outline of the story of Surgeon George Bass is part of the instruction of every Australian school-boy, often told and needing no repetition by me. We can only speculate upon his end; but we, his colleagues, will remember the heroic and tragic man who tried to bestride the Blue Mountains, explored the south coast of New South Wales in a cockleshell, confirmed the discovery of coal, circumnavigated Van Diemen's Land, and then, as Carlyle said of La Perouse, "vanished into blue immensity".

Nor can I talk at length now of that queer Puck-like doctor, D'Arcy Wentworth, of the best Irish blood, but a trafficker in rum, and yet a man of such quality that the austere and somewhat pompous Macquarie thought highly enough of him to make him a magistrate.

I will defy any historian of the future, medical or lay, who may write of our country, to omit the name of Dr. William Redfern. As a surgeon's mate of His Majesty's ship *Standard*, a stripling of nineteen, he was found guilty of complicity in the famous mutiny at the Nore in 1797. Without further research we cannot say at this time what part Redfern played in the upheaval, which, like the similar trouble at Invergordon, seems to have given the Lords of the Admiralty a salutary surprise. The chances are that Redfern took no active part in the pother beyond expressing his candid opinion about the dreadful food which the ratings on the lower deck refused to eat, and the filthy conditions under which they lived, mostly without pay. At most he seems to have counselled caution and concerted action as necessary to a quiet and successful outcome. After the mutiny at Spithead, largely owing to the reasonable way in which the seamen presented their demands, and to the common sense and humanity of Earl Howe—the sailors' beloved "Old Black Dick"—there was little or no victimization; but during the noisy and ill-managed affair at the Nore, the Admiralty made it plain that there must be no more nonsense. In Redfern's ship twenty-eight men were court-martialled; of these, ten were sentenced to death, and Redfern was one of them. In the end, three men only were executed. Redfern was spared the death sentence in consideration of his youth, but languished in an English prison for four years, and was then transported as a convict to Australia, reaching Sydney in the year 1801. Two years later he was a free man. During the interval he had done excellent work as an assistant surgeon at Norfolk Island; so well indeed had he fulfilled his duty that Lieutenant-Governor Foveaux appointed him assistant-surgeon at Sydney as a reward. But besides bearing the shameful brand of the convict, Redfern laboured under another grave disability—he possessed no medical qualification. True, he had faced and passed certain examinations in medicine before he began his disastrous naval career, but he had been given no diploma, and a diploma he

must have. To meet the difficulty, Foveaux set up a special board of examiners, made up of the principal surgeon of the day, Jamison, with a military and an assistant surgeon as fellow members. Redfern completely satisfied this tribunal and was granted the first medical diploma ever issued in Australia. But his troubles were by no means over—they had hardly begun. Although Redfern had the good opinion and liking of Governor Macquarie, who had assumed office in 1810, he was that hated object an emancipist, and as such was held in contempt and heartily disliked by the other officers of the establishment. Macquarie, after his arrival, showed plainly that the emancipists, and particularly Redfern, had his sympathy and support; and the doctor was the central figure in a storm of bitter argument. If we could read in full the story of all those mean and snobbish disputes, we should find likely enough that Redfern must have endured without a whimper an intolerable load of insult and contumely which would have crushed the spirit of a less courageous and forthright man. A worthy citizen and a talented practitioner of medicine, he did not hesitate to render professional service to the bitterest of his foes; but neither his gifts, his generosity nor the influence of Macquarie could save him from the contempt and hostility of the anti-emancipists. Through hatred and wire-pulling a junior man was promoted to the post of principal surgeon, when Redfern on ethical and professional grounds had every right to the appointment, as well as the recommendation of Macquarie to back up his claims. Indignant and disgusted at this setback, Redfern threw up his official position and devoted himself to his private practice. He was successful from the start; he was the favourite doctor of all classes, and his practice was the largest in the colony. All his colleagues sought him in consultation, and many of his anti-emancipist enemies were not too proud to become his patients. As his fortunes improved, Redfern felt more and more the call of the land; he was never happier than when among the vines and sheep on his country estate of Campbell Fields, and his knowledge of animal husbandry has made him an historic figure in the Australian wool industry. The Bank of New South Wales, founded in 1817, included Redfern among its first directors, and he was a leader in the formation of the Benevolent Society. He visited England, once in 1821, to plead the cause of the emancipists, again in 1825, and for the last time in 1828. And in England in the year 1833 this fine doctor, philanthropist, financier and pastoralist died at the early age of fifty-five.

I find it difficult to say anything that is new of another great doctor of the early days, William Bland. Like Redfern, he reached Sydney under a cloud. Bland was the son of a successful London obstetrician, and, like Redfern, he had been a naval surgeon, having served in His Majesty's ship *Hesper*. While on this commission Bland had been forced into a duel with the purser of the ship, who was a truculent brawler; and the end of the affair was

that the purser lost his life. Bland was sentenced to a term of seven years' imprisonment for killing a fellow-officer. Reaching Sydney in 1814 as a convict, he was made prisoner-in-charge of the lunatic asylum at Castle Hill; but after twelve months at this unsavoury work he found himself a free man and at once started for himself in private practice. A good speaker, with a turn for writing, Bland busied himself in the battle for political freedom. But his own personal liberty was not to last for long. In 1818 he was unwise enough to compose and circulate a set of verses dealing with the rather obvious vanities of Governor Macquarie. That very able, though somewhat self-important, dignitary was not the man to swallow such gibes, and Bland was bundled without delay into Parramatta gaol, where he cooled his heels for a year. Naturally, after this lesson the doctor came out of prison with the determination to select the targets for his satire more carefully in the future; but this resolve did not prevent his throwing himself with renewed vigour into the struggle for parliamentary representation. At last, in 1843, Bland and his lifelong friend, the great William Charles Wentworth, topped the poll in the election of the first legislative council. During all these years Bland had done much more than merely earn his living in private practice; he was also a founder of the Benevolent Society and helped to establish the old Sydney Dispensary in 1826. Here there was an out-patient department and the headquarters of a staff which visited the sick poor of the town. The first Grammar School, founded in 1825, owed its birth to the efforts of Bland; the school was short-lived, for it was replaced by the Sydney College; and the Sydney College in turn was later merged in the University of Sydney. But we must regard Bland, as we regard William Charles Wentworth, as the great champion of the cause of Australian emancipation. The medical profession in that first elective body was represented by two men, William Bland and Charles Nicholson. The latter was three times Speaker of the Legislative Council, a noted benefactor of the young University of Sydney, a baronet, and the owner of honorary degrees bestowed by several universities in England. Bland lost his seat in an election for the Assembly in 1848. But ten years later he took his place in the now established Upper House and remained there until 1861.

Many have dealt more eloquently than I with the splendid character of the many-sided Bland. He was a friend of the sick poor, a fighter for the under-dog, and a careful guardian of his own personal honour. No whisper of scandal ever touched him. Cheers and hand-claps meant nothing to him, though he could not escape popular applause. I can think of no man who outshone him in patriotism and generous impulses. A decade before his death it was said of him that for forty years he had worked for the poor and afflicted, for the promotion of education, literature and the arts, and for the rights and privileges of the colonists as British

subjects. He kept at his work until a fortnight before his death from pneumonia in 1868. He lived to be seventy-nine, and his coffin was the first to rest in the mortuary chapel at Redfern (now Sydney) station.

One June day in 1829 His Majesty's ship *Sulphur* sailed into Cockburn Sound, Western Australia, and aboard her was surgeon Alexander Collie, R.N., a Scot from Aberdeen. Australian medical history is dotted with the names of Scots and naval surgeons. Collie was a lover of Nature, a botanist and geologist, and a fine explorer. Once ashore, he began an examination of the trees, made a botanical collection and studied the records of the rocks. In 1831 he explored the country lying between French River and Albany, and made his way along each side of the Swan River to the site of modern Perth. He discovered and named the Collie River and came upon coal there. For this piece of work Collie and his friend Lieutenant Preston were given a grant of 2,000 acres of land. Soon afterwards, Collie, with the purser of the *Sulphur*, received an additional grant of 2,560 acres. But all this time the surgeon worked at his profession. While at Clarence, near Rockingham, he seems to have cleared the place of a mixed lot of infectious diseases. He became a justice of the peace and Government resident at King George's Sound, a drab hole with a population of forty people. Two years later, in 1830, Collie gladly left for Perth to become colonial surgeon. His interest in medicine had never waned, and he saw to it that his private library was sent out from England, as well as a parcel of all the latest medical text-books. Alexander Collie was never a strong man physically; throughout his career in Western Australia he had suffered from what he assumed to be bronchial asthma. So sick and weak did he become that he was granted two years' leave of absence in order to recover his health by a change of climate. He was almost on the point of boarding the ship in which he was to make the voyage back to Scotland when he died suddenly in 1835. The "asthma" proved to be pulmonary tuberculosis. His memory is commemorated by a granite monolith which stands in the centre of the town of Collie.

The story of John Stephen Hampton is written large in the history of Western Australia. He too was a Scot, and graduated at Edinburgh in 1828. He became a naval surgeon and was concerned at Portsmouth with the terrible task of arranging the transport of convicts. He had the reputation of being a hard disciplinarian when, later, he was comptroller-general of convicts in Van Diemen's Land. In due time Hampton was selected as Governor of Western Australia, a post which he held from February, 1862, until November, 1868. Hampton had some of the attributes of Macquarie—he was a builder. He set convicts at work to make roads, build barracks on the slopes of Mount Eliza, and to construct drains and keep back the encroachments of the Swan River with retaining walls. During his term of office new police stations sprang

up, and a start was made on the town hall in Perth. An expedition was dispatched to seek for gold, and the first wool clip from the far north-west arrived in Perth. Hampton established a post office savings bank and a money order system. The colony of those days consisted of 25,000 people with but 50,000 acres of arable land; nevertheless when Hampton went out of office the public accounts showed a surplus of £10,000—he left a Western Australia that was free of debt. When the news got abroad that Hampton was about to leave, the colonists besought the Secretary of State for the Colonies that the Governor should be permitted to stay, but to no avail. On November 2, 1868, Hampton was escorted to Fremantle by a huge body of civilians and soldiers, and there, we are told, "there was a good send-off".

An interesting and tragic figure is that of Dr. Adam Jameson, a son of the manse, who came to Western Australia in 1885. Elected to the legislative council, he served several times as a Minister of the Crown. An ex-Governor of Western Australia, who had become Lieutenant-Governor of the Transvaal, managed to secure the appointment of Jameson to the post of commissioner of lands in the Transvaal. Jameson took up his duties in 1903, to retire on a pension when the Union of South Africa was effected. Travelling home to England through Portuguese East Africa, he was killed in a railway accident while in his sleeping berth.

I should like to tell again, were there time enough, the story of Dr. Henry Landor, who lived for five years among the aborigines of Western Australia and gained an unrivalled knowledge of their customs; and of Dr. Charles Laver, explorer and prospector, a man who walked fifty miles in one day. His name is a household word at Kalgoorlie, where he still lives; and the town of Laverton is named after him.

The State of Victoria owes much to the public-spirited work of many medical men now dead. We may recall the name of Dr. Alexander Thomson, who in 1836 was medical officer to the Batman syndicate. He was the founder of Geelong, the first doctor, the first mayor, and the first newspaper proprietor of that town. With others he made the first ascent of Mount Buninyong. But Thomson's chief claim on our attention rests on his unceasing advocacy of the political separation of Victoria from New South Wales. He sat as a Victorian representative in the first legislative council here, and was later a member for Geelong in the Victorian parliament.

The life of Dr. John Pearson Rowe was that of a broad-minded medical man who served his adopted country well. Rowe was born at Aintree, then, as now, the place above all, in England, where the horse is worshipped. He arrived in Sydney in 1834, but proceeded to Hobart and joined Dr. Crowther in practice. In 1843 he came to Port Phillip, and we hear of him at "Loyola" on the Delatite run, and then at "Restdown" on the Campaspe River.

In those days the feverish hunt for gold had begun in Victoria, and the generous old custom of a "hand-out" for all-comers had been stretched to breaking point by the hordes of gold-seekers of all nationalities who were streaming to the fields in search of fortune; the squatters and settlers were being eaten out of house and home. To meet an urgent need, Dr. Rowe built an hotel at the Campaspe crossing, and round it a town sprang up. The inn bore the name of "The Apelles". Apelles, you recall, was a Greek painter of such talents that Alexander the Great would suffer none but him to paint the royal features. Campaspe, whose name the river bears, was the beauteous and favourite concubine of Alexander. With this story in his well-stored mind, Dr. Rowe baptized his country hostel "The Apelles". But the classical knowledge of the polyglot crew which ate and drank and brawled there was not of the same level as the doctor's, and to all travellers the house was known as "Seward's Apples". A certain Seward was the first licensee, and he must have lived through many roaring days and nights.

Gradually Rowe acquired stations in the north and north-eastern districts of Victoria. He imported fine-wooled sheep, including some rams from the famous Silesian stud of Prince Lichnowski, and was a founder of the Victorian wool industry. It is told of him that he introduced the use of the lime and sulphur dip to combat "scab" in sheep. Besides being a member of the original university council, Rowe formed one of the committee which founded the Melbourne medical school. His town mansion, surrounded by rose gardens and vineyards, was at Toorak, and was the constant resort of all the musical and literary people of the time.

Another Victorian medical man who was a successful pastoralist was Dr. William Clark Haines. He had outstanding political gifts as well, and was an ardent separationist. He was a member of the first legislative council in 1851, and was subsequently colonial secretary and, after Victoria was granted self-government, the first premier of Victoria. A staunch Anglican and a man of somewhat severe and silent habit, he yet owned a string of racehorses and was a hard rider to hounds. He was a friend and fellow student of William Makepeace Thackeray, and maintained a correspondence with the famous novelist.

In the early sixties—I cannot be sure of the date—a young Ulsterman arrived in Melbourne as surgeon in an emigrant ship. With most of the passengers he made his way to the goldfields and set up practice after a while in the small settlement where he remained for something over fifty years. He was a book-lover, with a flair for anecdote, an eye for a well-turned ankle and a discriminating taste in wine and tobacco. The place declined as a mining centre, and it turned gradually into a quiet village. The doctor's wife bore him a family of six sons and four daughters; and of these all the sons save one became artists. Two of them have reputations which extend far beyond Australia.

Norman Lindsay, apart from his genius for etching and his amazing use of water-colour, is excelled by few in the world in his use of pen and ink. Lionel Lindsay has few equals in the medium of the wood-cut, and the high quality of his etching has won him fame both in Australia and England. Two others of the doctor's sons have painted many beautiful landscapes, and one daughter, the wife of the lately dead William Dyson, would have reached great heights as a writer and artist but for her untimely death. Such is the gift to Australia of the late Dr. Robert Charles Lindsay, of Creswick.

Among Tasmanian medical men one of the most remarkable was Dr. William Birch, who arrived in the Derwent in the year 1808 aboard an unseaworthy whaler, which was promptly condemned. Dr. Birch was himself a seasoned whaler and seaman, and we read that in 1815 he fitted out a whaleboat in which, with a crew of five, he circumnavigated Tasmania, discovering Macquarie Harbour and Port Davey on the voyage. For this fine service Birch was granted a valuable timber monopoly for a term of one year. The doctor was the owner of three ships, and prospered by the carriage of goods and passengers, and in sealing ventures. He was besides a builder of houses in Hobart. At his death in 1821 Birch left a fortune of £40,000. He lives in history as one of the best type of old-fashioned merchant-adventurers.

I should like, if there were time, to mention that remarkable medical family of Tasmania, the Crowthers, and also many other doctors of the past in South Australia and Queensland. I hope, however, that what I have said supports the contention that there have been doctors who have been not only capable medical men, but good citizens.

There are many ways today in which doctors are giving splendid voluntary service for the public good, quite apart from their usual daily round of professional work. In almost every city and town throughout Australia doctors or members of their families are to be found in the forefront of any movement for the general welfare of the community. In our own city there are numerous charitable and other important societies upon the executives of which are members of our profession, both men and women, helping to improve in one direction or another the lot of their fellow citizens. Especially should I mention those organizations, probably peculiar to Australia, which bring health and happiness to many hundreds of our outback people. I refer to the Australian Aerial Medical Services and the Far West Children's Health Scheme. We all are aware of the wonderful work of these and similar bodies, but many are not aware that a great part of the executive work is done by some of our own members, who give much time, and often travel far in the performance of their self-imposed tasks. Even those who labour to maintain and improve the status and efficiency of our profession as a whole, or of its special branches, indirectly serve the public good. They work behind the scenes, but they assist in providing a medical service, whether general or

special, which is abreast of the times and of the highest standard.

Lastly, but above all, let me mention those of our brotherhood who have ventured upon the hazardous sea of politics. Some of these public-spirited doctors have been honoured with ministerial rank, and one within recent times has been Premier of his State. It is scarcely necessary for me to refer to Sir Earle Page, G.C.M.G., who for so many years has been a leader in the Federal legislature, has held a number of ministerial positions, and has been on more than one occasion the acting Prime Minister of Australia. Sir Earle Page is a worthy successor of those early pioneer doctors who laboured so faithfully for the advancement of their adopted country.

In bringing this address to a close I should like to end on this note. In the medical history of our country there is much that is inspiring, and I trust that I have succeeded in some measure in inspiring my audience, for "in the continued remembrance of a glorious past individuals and nations find their noblest inspiration".

Acknowledgements.

I am indebted to the writings of Dr. E. Alan Mackay, Dr. W. L. Crowther, Dr. L. Cowlshaw, Dr. Norman J. Dunlop, and Dr. G. T. Howard for much of the material used in this address. Mr. F. I. Bray, of the State Archives Board, Perth, has written a fine monograph upon some of the early medical men of Western Australia, which has been most useful. My thanks are due also to Miss Rolleston, the librarian of the New South Wales Branch of the British Medical Association, for giving me access to many journals. Finally I wish especially to mention Dr. L. Cowlshaw and Dr. F. J. Bridges for their valued assistance.

PUBLIC HEALTH LEGISLATION: ITS EVOLUTION IN SOUTH AUSTRALIA.¹

By A. R. SOUTHWOOD, E.D., M.D., M.S., M.R.C.P. (London),
F.R.San.I.,

Honorary Physician, Adelaide Hospital; Chairman,
Central Board of Health of South Australia.

Health Laws in England.

CHADWICK'S "General Report on the Sanitary Condition of the Labouring Population of Great Britain" is the great landmark in public health history. There had been some early attempts at legislation dealing with sanitation and the removal of nuisances, but the real awakening in public health came after the adoption of the *Reform Bill* of 1832. Indignant at the wrongs suffered by the poor, William Cobbett and his followers had won this advance—an advance which inspired further measures for social amelioration. The *Reform Bill* itself did not directly deal with preventive medicine,

but it was soon followed by the *Municipal Corporations Act* and other acts, which, by instituting a sound system of local government by elected authorities, established the basis of public health administration as we know it today.

In 1834 Edwin Chadwick had been appointed secretary to the Poor Law Commissioners, and very soon he became the leader in the fight for sanitary reform. The enemies confronting him were those which public health workers today still meet—opposition at interference with individual liberty, and the cry of "too much expense".

In 1848 England suffered heavily from cholera, and more than 54,000 lives were lost. In the same year the first *Public Health Act* came into being: Chadwick had at last persuaded Parliament that sanitation was a public question. The act set up the General Board of Health as the central health authority, and gave powers to local authorities to promote sanitary works and to control nuisances. The central authority had power to advise, direct, inspect and, if need be, compel. The actual sanitary work in each district was done by the local authority itself.

Chadwick was not a tactful man; he has been termed "an indefatigable busy-body", and perhaps his ill-governed enthusiasm led to the General Board becoming a very unpopular body. No doubt his very outspokenness on the sanitary evils about him made many regard him as a sort of crank. Yet he probably did more than any one man of his time to put public health activities on a sound basis. He and Southwood Smith, both associated with the General Board of Health, developed many of the principles that guide the work today. They had been greatly influenced by Jeremy Bentham, whom Charles Singer describes as "the direct begetter of our modern system of organization of the science of preventive medicine". The utilitarianism of the eighteenth century, the doctrine of "the greatest happiness of the greatest number", so ardently promulgated by Joseph Priestley and others, was carried on into the nineteenth century by Bentham, who regarded the pursuit of such happiness as the main object of human activity. Bentham was the real intellectual force in the development of preventive medicine.

The year 1848 also marked the appointment of John Simon as Medical Officer of Health to the City of London. Within seven years Simon had carried out almost all the improvements recommended by Chadwick. In 1855 Simon became Central Medical Officer to the reconstructed Board of Health. The Local Government Board was formed in 1871 and took the place of the General Board of Health, and until the Ministry of Health was set up in 1919 the Local Government Board was the central health authority in Britain.

The translation of the doctrines of personal health into acts of parliament to direct the health of a nation is no easy task; it is therefore a matter for very great pride that Britain has led the world in public health legislation. The *Public Health Act*

¹Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

of 1875 was a vast code of sanitary laws. It remained the basis of health legislation in England till 1936, when a series of bills was begun in the attempt to codify and simplify the existing English law of public health.

The First Health Act in South Australia.

As Dr. Frank Hone has indicated in his article in "The Centenary History of South Australia", the development of health legislation in South Australia has largely followed the precedents of English law. The colony was just established when the cholera epidemic in England aroused general interest in public health. It was not until 1873, however, that the first comprehensive health act was passed in South Australia. It was described as "an Act to make provision for the preservation and improvement of public health".

Reports of the speeches made in Parliament when the bill was under consideration provide an interesting commentary. The Chief Secretary, in introducing the second reading of the bill, said that it dealt with all sorts of disagreeable subjects, and, as honourable members would, he thought, admit, subjects which had been already too long delayed. If they would carry their recollection back to the summer of 1870-1871, when they had, in addition to the usual heat, a great deal of moisture, it would be remembered that a great deal of annoyance was caused by the presence of noxious smells, and, what was far worse than that, of the seeds of very dangerous maladies. It was at this time attention began to be roused to the fact that nothing had been done for the preservation of the public health. It was generally admitted that to our very fine climate and to the city's not being very densely populated, more than to anything else, we were to attribute our freedom from any serious amount of sickness. Epidemics had been rife at certain times and places, and lives lost, probably through want of attention to cleanliness and drainage—all those things tended to show that the time had arrived when they should consider whether it was not desirable, in the language of the preamble, "to provide for the preservation and improvement of the public health".

Although the bill dealt with "all sorts of disagreeable subjects", the members generally approved the measure. Discussing the matter of nuisances, one member referred to the filthy emanations from boiling-down establishments and such concerns at Hilton and that neighbourhood. It was no use talking about vested rights in businesses of this sort, as no man had a vested right to poison the atmosphere, however he might have a vested right in land to use it so long as he did not do so to the injury of his neighbours. One member quoted approvingly from a speech of Lord John Russell, delivered in 1857:

Every Englishman's house is his castle, but he has no right to make his castle the manufactory for diffusive nuisances—to render it a stronghold or keep, say for the

non-drainage of a particular spot. Every Englishman's house is his castle, but he must not be allowed to shoot poisoned arrows at the community from the battlements.

Some members even complained that the bill did not go far enough. The omission of any provisions to deal with "what might be described as the social scourge" was commented on. Another suggestion was that the Government should proclaim certain areas where noxious trades could be carried on, and it is interesting to note that even at this early date in the colony's history the situation of the West Terrace Cemetery was adversely criticized. One member thought that when with the railway we could reach a ground twenty miles out in an hour, the Government should close up the West Terrace Cemetery and select a fresh site. Some members objected to the number of slaughterhouses being allowed to exist close to the city, and thought that there might be a train to bring the slaughtered meat to town, and that the slaughterhouses should be far from the city instead of being upon the banks of the Torrens.

The views of Dr. Whittell, who was later to become President of the Board of Health, were quoted in the House.

In Adelaide, so far as my observation goes, sanitary conditions are either utterly disregarded or are left to the caprice of the inhabitants. The city may be correctly described as "a city of stench", and these are of the most disgusting kind. It is impossible to walk through any of the streets (especially after sunset) without being sickened by the smells from closets, stagnant water and decomposing matters in the water-tables. Within the city offensive trades are carried on, to the great annoyance and injury of those residing near. The suburbs, which ought to be healthful places of resort, are in the hands of fellmongers, tanners, bone-boilers, manure manufacturers, and proprietors of boiling-down establishments, who appear to be privileged to create any nuisance they please, without the slightest regard to the health or comfort of the citizens. Before I came to Adelaide I practised for some years in Birmingham, and I can say without exaggeration that the offensive smells in the worst of what is called "the back slums" of Birmingham were never worse than I frequently notice in our principal terraces and streets.

A very useful act was eventually passed. It provided for the cleaning of streets, the disposal of rubbish, the seizure of unwholesome food, the abatement of nuisances, and powers of inspection. It provided for the establishment of a central controlling authority to superintend the execution of the act; the council of each town was made a local board of health, and local boards could also be set up in district council areas. It provided that sanitary works were to be performed by local boards, that the central board was empowered to direct local boards to carry out specified works, and that the central board itself might do certain works at the cost of a local board if the local board defaulted. The central board was also enabled "to issue such regulations as it shall think fit to mitigate, as far as possible, the effect, and to prevent and check the spread of epidemic, endemic or contagious disease". The system of public health administration in South Australia was definitely established, and, as

in other countries, more and more acts and regulations were to follow. Individual liberty, expense, these can hardly stay the progress in public health!

The Central Board of Health.

The Central Board of Health, constituted under the 1873 act, held its first meeting on January 13, 1874. Dr. William Gosse was the president, and the members appointed by the Governor were Lieutenant-Colonel William Barber, Dr. Allan Campbell and Messrs. William Kay and Frederick Wright. The constitution of the central board was altered by the *Health Act* of 1898, so that while the chairman and two members were appointed by the Governor, the other two members were elected by local boards of health.

The board at first met weekly, and the minute books of the period show that the discussions centred mainly round the subject of nuisances. In its first annual report the board condemned

the present state of the city of Adelaide as regards drainage and cleanliness. The present system of sewerage, if it can be so called, is inefficient and unworkable . . . By the inauguration of a system of drainage, not only would the health and comfort of the citizens of Adelaide be materially benefited, but manufactories and establishments which now, from the want of proper drainage are, or may become, a source of nuisance, could be conducted without offence or annoyance.

The West Terrace Cemetery again received criticism; the board recommended that an appropriate cemetery site should be purchased some miles out of the city. The board strongly recommended for Adelaide and other towns the provision of public abattoirs "with all the modern appliances". The need for a quarantine station was pointed out. The report said that official visits of inspection to districts of local boards would form an important portion of the central board's regular duties.

The central board began its work with high ideals, and it soon found the need for additional legislation, especially to permit it directly to control health matters in areas outside the boundaries of local boards. In 1876 an act "to make further provision for the preservation and improvement of the public health" was passed. This act gave the central board additional powers. Legislators acknowledged that the exertions of the central board and of the local boards of health had done much good, and that the wider powers were necessary. It was realized that sanitary legislation was a comparatively new thing, and that additions and amendments were inevitable.

A further amending act was passed in 1884, providing for the notification and isolation of cases of smallpox, cholera, plague, yellow fever or "other dangerous contagious or infectious diseases which may be declared by proclamation". The chief provisions of this amending act were derived from the imperial act of 1875 and a Victorian act of 1883. The principle of compulsory notification by medical attendants was strongly opposed by some of the medical members of Parliament, as being an undesirable interference with the relations between

medical attendant and patient. They preferred that the doctor should inform the householders when cases of infectious disease occurred, and that the onus for notification to health authorities should lie with the householders and not with the doctor. Dr. Stirling (later Sir Edward Stirling), however, was wise enough to point out that in some respects the medical man had a higher duty even than that to his patient—a duty he owed to the State.

The 1884 act prohibited children who had suffered from any infectious or contagious disease from attending school unless certified free from infection. The act gave power to local boards to provide hospitals, and to the central board to make regulations for the sanitation and control of dairies. By this time the recognition of the personal factor in the spread of infectious diseases had taken place. The prevention of the spread of illness was realized not to depend solely on environmental sanitation. Yet it is interesting to read in the minutes of the central board in 1883 that a medical member of the board attributed the prevalence of typhoid fever at the time to "general climatic influence and not to local causes".

The Health Act, 1898.

The *Health Act*, 1898, was a still more comprehensive measure. It repealed the previous health acts, and, with several amending acts, it remains the basis for the present administrative arrangements in South Australia, although the act itself was repealed when the *Consolidating Act* of 1935 was passed. In introducing the bill of 1898 in the Legislative Council, the Chief Secretary said that if the provisions of the bill were carried they would have a measure which embodied the best principles contained in the health legislation of the colonies and of Great Britain, which was thoroughly up to date, and which placed the health laws of South Australia in advance of anything they had yet in the British dominions.

Dr. Allan Campbell, at that time a member of the Legislative Council and no longer on the Central Board of Health, supported the general principles of the measure. Since 1873, he said, vast strides had been taken with regard to many important aspects of public health. For instance, in 1884 Professor Koch, of Berlin, discovered the bacillus of tuberculosis, and from that time he had been working with other men in the same direction until they had now a conception of infectious diseases of which twenty years before they had not the slightest idea. That conception had entirely remodelled their plans with regard to public health.

Infectious diseases received greater consideration than in previous acts. Notification and isolation of sufferers from diphtheria, scarlet fever, typhoid fever and puerperal fever were required. Dr. Campbell was very anxious that pulmonary tuberculosis should be proclaimed a notifiable disease; he said that they had agreed that notification must take place of diseases mentioned in the bill, and tuberculosis, which was not included, was the most

infectious and caused more deaths than any other infectious disease. The process by which death came about was slow, but if it came in the same quick way as other epidemics they would be horror-stricken at the terrible inroads of the disease. Why was it not included? In the face of a disease which was destroying more human beings than any other, it was cruel and monstrous that they should exclude it from the list because it cost half a crown for the notification.

One member of Parliament opposed the suggestion of Dr. Campbell on the grounds "that consumption was hereditary and not communicable by one human being to another . . . The council would be making itself the laughing stock if it included consumptives in this class. His gorge rose with the indignation he felt at Dr. Campbell's inhuman proposal". Dr. Campbell thereupon expressed his astonishment "that anyone at the end of the nineteenth century could stand up and deny that tuberculosis was infectious".

The central board of the time opposed the inclusion of tuberculosis in the list of infectious diseases. The board "felt it would be impracticable to deal with such a disease after the same manner as the more acute infectious diseases". Dr. Campbell explained in the House that "he did not want to interfere with the person; he only wanted notification. With a judicious health body and notification they would be able to do an immense amount of good." And so provision for notification, but not for isolation, of cases of pulmonary tuberculosis was enacted.

There came a note of tragedy. Throughout the long passage of the 1898 act in the Legislative Council Dr. Campbell worked hard to give the State sound and progressive health laws. He met much opposition and was seriously disappointed. It was apparent, he said, that after all the efforts he had made to lift this matter of the public health to a proper level, those efforts had been in vain. Three weeks later Dr. Campbell died rather suddenly. He had been engaged, it was said, in a lifelong struggle against the attacks of an insidious disease. Memorial addresses in Parliament stressed the high value of his work. The Honourable J. H. Gordon said that there would be on behalf of the council, he knew, but one voice as to the deep grief they felt. In all the highest spheres of public duty the Honourable Dr. Campbell's wise counsel and self-denying labours would be sadly missed. His pure aims, no less than his high personal character, made his life a bright example to all men and his death a national misfortune.

Future Trends.

South Australia has made, and I hope will continue to make, sound health laws. Yet the path of progress is ever a thorny one. Difficulties are encountered and are gradually overcome.

"Hands off the liberty of the subject" is a cry not yet completely stifled, although it is fairly generally accepted in these days that when the community's

health is concerned the individual must suffer restrictions if circumstances require them. In discussing the 1898 bill one legislative councillor stoutly upheld individual rights. He could not understand the support the bill was getting. It would let loose a horde of bloodhounds who would have their noses in everybody's back yard. The Honourable J. L. Stirling (later Sir Lancelot, and a brother of Sir Edward) took a broader view. He said that there was strong argument that public health was a proper and fair sphere for government interference, and they must expect some slight curtailment of individual freedom of action.

The mounting expense of public health services is sometimes deplored, yet it should be an axiom that no wisely directed expenditure on public health is money wasted. When it was proposed in the bill of 1898 to pay the doctor a fee of two shillings and sixpence for each notification of a case of infectious disease, one member moved to strike out the words "two shillings and". He thought sixpence was enough. Supporting the motion, another member said that if there was an epidemic of scarlet fever it would be absurd to give a fee of two shillings and sixpence for each case reported, especially as the doctor would be getting his ordinary fees from the patients also. Many of the diseases were very frequent, and a doctor could make a fat income out of reports. The black sheep of the profession might report half a street that was not affected and get the fees.

The fear of expense, if not yet completely banished, has been greatly mitigated. The fact, however, that local authorities have to bear most of the expense sometimes raises difficulties. Many local board areas are sparsely populated, and the funds available from rates are insufficient for the payment of an adequately trained staff or for great development in public health work.

It is possible that one line of progress will be the amalgamation of several adjacent local boards in an area; the pooled funds would permit of development of the health work along modern lines. Dr. Campbell in 1898 battled hard for the establishment of a metropolitan board of health, a greater Adelaide health authority, controlled and financed by all the local boards of the metropolitan area, and dealing with all aspects of public health work. He failed to gain the point. Provision was inserted in the act for the voluntary amalgamation of local boards into county boards of health, but little use has yet been made of this provision.

The principle of health administration by local governing authorities is almost as deeply ingrained in our South Australian legislation as in that of Britain. The idea of local responsibility and central supervision is firmly entrenched. As long as the aims of preventive medicine are zealously sought, it matters little whether local or central authorities provide the money, for the gain is the whole community's. But let the ideal never be hidden: health is a public asset, and its promotion a public duty.

CONCOCTION OF SPIRITS FROM THE TIME OF GALEN ONWARDS.¹

By E. F. GARTRELL,
Adelaide.

IN view of the fact that this congress is centring round tuberculosis, I thought it might prove of interest were I to set before you some of the facts relating to the investigation of the pulmonary circulation.

To whom among the ancients shall we look for the primitive ideas on this subject?

Undoubtedly Galen, by his writings in the second century A.D., has sealed his claim to our regard, for not only has he given us a most comprehensive summary of Greek medical knowledge, but has leavened this with his own determinations arrived at by physiological experiment and logical deduction. So all-embracing and authoritative was his work considered to be that for no less than fourteen centuries it was regarded as the oracle to be consulted by every physician seeking a solution to his problems. In assessing his efforts it behoves us to remember that in the absence of any adequate number of proven facts from which to make deductions or obtain leads in new directions, innumerable assumptions were inevitable, and therefore any real achievements were all the more meritorious.

Among the problems clamouring for solution in those days were three of paramount importance: (i) the cause of animal heat, (ii) the meaning of respiration, which process was known to be essential to life, (iii) the function of the blood.

The chemistry of the blood not having been conceived, its active principles were designated spirits, by which term was understood an all-pervading essence. The natural spirits, controlling nutrition, growth and propagation, were derived from the liver and distributed to the body by the tide-like ebb and flow of the blood in the veins. The vital spirits were formed in the lungs and left ventricle, to be distributed by the arteries in order that they might supply heat and energy and produce certain activities, such as the movement of the blood.

The animal or psychic spirits were described in these words:

The noblest of them all are formed when the vital spirits are again refined, elaborated and perfected in the choroid plexus which contains the very mind itself, this elaboration being aided by a fresh supply of air . . . at the base of the brain.

It is the vital spirits towards which I would direct your attention. In Galen's scheme of the circulation the recognition of the fact that the tricuspid valves trapped any blood passing through them induced him to assume the presence of pores in the interventricular septum, through which the blood flowed from the right to the left ventricle. Apart from this, he thought that a small quantity

travelled along the pulmonary artery to the lungs, where some interchange of blood was necessary owing to the pulmonary valves preventing any return flow to the right ventricle. The first stage of the concoction of vital spirits took place when this blood was squeezed by the lungs into the pulmonary veins. This process, involving only a small quantity of blood, was said to be completed in the left ventricle with the addition of the air which permeated the skin. This vital blood, then, was the source of heat and energy.

The idea of concoction of spirits was originated long before Galen, for Heraclitus (556-460 B.C.) spoke of "animating fire that was something between air and flame, penetrating and vitalizing everything", while Aristotle spoke of the pulmonary vessels and air passages running parallel that the blood might receive the breath. In 300 B.C. Erasistratus, at Alexandria, held that the left heart and arteries, which were empty, communicated by means of the small bronchi with the *arteria aspera* (trachea) in order to convey the spirit of life (*πνεῦμα*). Another long-standing conception was that the fuliginous vapours from the arterial blood were carried by the pulmonary veins to the lungs for excretion. Galen's ingenious assumption was that this reverse flow could occur because the mitral valve, having only two cusps, was not fully competent. The other functions attributed to the lung were to aid the tide of the blood, to ventilate and cool the blood, and to shelter the heart.

Modern work has supported these ideas by physiological proof, and has led to an understanding of the manner in which these duties are performed.

Passing over that long period from Galen to Harvey, we find but little progress in the elucidation of the pulmonary circulation. Leonardo da Vinci (1452-1519), although an outstanding figure in many spheres in the realm of science, had no merely superficial knowledge of physiology, but a deep insight obtained by the thorough and scientific analysis of the results of his many researches. Although some authorities find it difficult to believe that he did not perceive the true manner of the circulation, yet from the small portion of his writings left to us it appears that, although he discovered that the heart was really a muscular pump and thought that the lungs aided the return of the blood along the pulmonary veins, he still adhered to the theory of the tidal flow of the blood. He was certainly not greatly impressed by spirits, but he did believe that something from the air in the lungs was transferred to the blood by mere contact of the ends of the air tubes and the blood vessels, though he could find no communication.

In "*Restitutio Christianismi*" in 1553, Servetus, discussing the vital spirit, says:

It is a subtle spirit elaborated by the force of heat, of a bright colour, with an igneous power, a lucid vapour as it were from the purest blood containing in itself the substance of water, air and fire . . . it is made bright by the lungs . . . mixed with inspired air in the venal artery (or pulmonary vein) and cleansed from grossness by expiration.

¹Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

His reference to water, air and fire reminds us of the parallel between concoction and oxidation. Servetus also pointed out that a sufficient pulmonary circulation did away with the necessity for Galen's theory of inefficiency of the mitral valve.

In explanation of the thickness of the wall of the left ventricle, Columbus advanced the ingenious hypothesis that it was to prevent the vital blood, which was very thin, from transuding out of the heart. He said (1559) that this thin blood was brought back from the lungs together with air, and claimed that "this fact no one has hitherto observed or recorded in writing". His ideas on this subject, however, do not really appear to have been much ahead of those of Galen, for he still thought that the vital blood was merely a subsidiary portion of the whole. Cespallino (1524-1603) possibly had a clearer idea of the pulmonary circulation. He said:

Thus there is a sort of perpetual movement from the *cava cava* through the heart and lungs into the aorta artery.

However, he concluded that:

When we are awake a large supply of blood and spirits flows to the arteries and thence to the nerves, but when we sleep the same heat is carried back to the heart by the veins.

After applying pressure to obstruct a vein he formed the following quaint conception of the results:

The blood rushes forcibly back to its source, lest being cut off it should be extinguished.

So we find that many authorities subscribed to the belief that some of the blood goes to the lungs to obtain something related to air and heat which is essential to life—that is, the theory of concoction or oxidation.

That the whole of the blood passed through the lungs had apparently occurred to none before Harvey; but he found many points in Galen's teachings that he could not believe.

Why, for instance, should the two ventricles, so similar in structure, have such different functions, the left forming vital spirits? Why should any of the heart valves leak, and especially why should the mitral valve permit the passage of fuliginous vapours but not of vital spirits? Why should the blood always pass through the septum from the right to the left ventricle and not in the opposite direction? Harvey therefore brought comparative anatomy to bear, showing that where there were no lungs the blood flowed from veins to the arteries through the heart. In the foetus the blood flowed through the patent *foramen ovale* and *ductus arteriosus*; therefore, if this passage existed when the lungs were not functioning, why did it close when they commenced to operate? His efforts to solve these and other problems led to his theory of the circulation.

Harvey eventually denied the 2,000-year-old doctrine of concoction because even after inflating the lungs with bellows he found no air in the pulmonary veins or left ventricle. Although the different colours of arterial and of venous blood should have guided

him, he reluctantly concluded that because both varieties of blood retained the same volume and assumed the same colour soon after being shed, this was an unimportant fact. He finally came to doubt the meaning and origin of spirits, saying: "Spirits are not from the air." So he disputed the theory of concoction and oxidation, which had held sway for 2,000 years. He admitted his inability to comprehend the significance of respiration, and wisely deferred further consideration of the subject.

Eight years after Harvey, Lower, having learnt from the master the value of experiments in physiology, injected dark venous blood into insufflated lungs, where its colour was changed to a bright red, wherefore he revived the theory of concoction.

In 1661 Malpighi, who was born in the year of publication of "*De Motu Cordis*", in a letter to Borelli, supplied the final link between arteries and veins, thus completing Harvey's stupendous achievement. He explained that in the frog's lung:

The blood showered down in minute streams through the arteries . . . the blood loses its red colour and is carried round in a sinuous manner . . . till it approaches the absorbing branches of the veins. The movement of the blood is tortuous and scattered in different directions and united again in a determinate part.

In the dried lung he found the anastomosing vessels "joined together in a ring-like fashion".

Spallanzani (1729-1799), a century later, applied this discovery of capillaries to a warm-blooded animal, via the umbilical vessels of a chick (1771). The solution of the problem of respiration was assisted by Mayow (1643-1679), who described the nitroaerial spirit. He it was who showed that heat production occurred in the muscles. Unfortunately, Stahl (1660-1734) hindered progress by his dephlogistication theory of combustion.

One hundred and fifty years after the publication of "*De Motu Cordis*", Van Helmont (1577-1644) worked on carbon dioxide, while Priestley (1733-1804) and Lavoisier (1743-1794) discovered oxygen, the latter explaining the part it played in respiration. He thought oxygenation took place in the lungs, and it was not till later that Lagrange (1791) and Magnus (1837) transferred its sphere to the tissues.

Our knowledge of the subject has certainly increased, but who of us can foretell how many vital secrets have yet to be divulged to the physiologist?

THE INDICATIONS FOR BLOOD TRANSFUSION.¹

By IAN J. WOOD, M.D., M.R.C.P.,
Marion Carty Research Scholar, Walter and
Eliza Hall Institute of Medical Research,
Melbourne.

IN *anæmia* the oxygen carrying capacity of the blood is reduced, and this state of *anoxæmia* causes widespread damage to the body tissues. The

¹Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

function of every organ is impaired, but in varying degrees. Thus there are general muscular weakness, dyspnoea on slight exertion, poor cerebration with inability to concentrate and failing memory, and finally evidence of kidney failure, as shown by an elevation in the blood urea content.⁽¹⁾ Until a critical level is passed the body has power to adapt itself slowly to this state of anoxæmia, and so a rapid hæmorrhage is more dangerous than a slow leak. For example, a person suffering from the chronic bleeding of hæmorrhoids may lead a comfortable life with a hæmoglobin value of only 30%, so long as he does not exert himself, whereas a patient who has a sudden massive hæmorrhage of six pints of blood from a gastric ulcer will be moribund and yet the hæmoglobin value may be above 30%. Depletion in blood volume also plays a part in this type of case.

It is very difficult to decide when one should transfuse citrated blood in order to produce an immediate relief from this state of anoxæmia. I have found the following guiding principles of help.

1. Severe anæmia causing immediate danger to life from anoxæmia.
2. Severe anæmia which can be cured slowly by specific medical therapy (for example, anæmia from hæmorrhage, iron deficiency anæmia and pernicious anæmia), but in which it is unwise to wait. Complications, such as pneumonia may set in, or a further hæmorrhage may occur. Perhaps a major operation may become necessary to arrest hæmorrhage.
3. Anæmia for which transfusion is the specific method of treatment or in which other specific treatment has failed.

I thought it would be of interest to discuss these indications and record some personal impressions which have guided me in deciding on the necessity for transfusion in a specific case.

Transfusion for Severe Anæmia Causing Immediate Danger to Life.

I consider that when transfusion is properly carried out there are no contraindications to transfusion in the group of anæmias causing immediate danger to life. The contraindications which have been put forward are, first, the danger of reactions either from incompatible blood or from pyrogenic substances, and, secondly, the fear of promoting further hæmorrhage when hæmorrhage is the cause of the anæmia.

Danger of Incompatibility.

So long as we adopt the necessary precaution of typing the blood by both direct and indirect methods, incompatibility will be of the greatest rarity. Incompatibility leads to agglutination of the corpuscles and embolism, and later hæmolysis occurs, with the liberation of free hæmoglobin into the blood stream. The symptoms consist of pain in the back and chest, respiratory distress and circulatory failure. Later there may be hæmoglobinuria, jaundice and renal failure. Death may occur. I should like to condemn as being dangerous the practice of simply mixing a drop of the donor's blood with a drop of the recipient's on a slide.

The only excuse for using this technique is in grave emergency, when other methods are not available. Incompatibility will not always be disclosed by this method, and some deaths will occur.⁽²⁾ Also one still hears of the transfusion of blood into infants without any preliminary typing whatsoever. Have Landsteiner and Moss lived in vain?

Pyrogenic Substances.

The next very real objection to transfusion is the reactions, such as rigors, pyrexia and circulatory collapse, which appear during or immediately after transfusion. These have aptly been termed "pyrogenic reactions" by American workers. I should like to join forces with the clinicians abroad who say that the occurrence of these pyrogenic reactions is usually a disgrace to the operator. They are nearly all due to unclean apparatus or citrate solution, and not to faulty typing. All apparatus should be thoroughly cleansed in specially distilled water. It should never be contaminated with tap-water, which swarms with pyrogenic substances. These dry on the surface of the apparatus after cleaning and redissolve in the blood. For the same reason sterilization should be carried out by autoclaving and not by boiling in tap-water.

Anæmia from Hæmorrhage.

With regard to anæmia from hæmorrhage, one of the most frequent arguments lodged against transfusion is the fact that the blood pressure will be elevated and this will precipitate further bleeding. It is probable that this phobia has caused many lives to be lost. I consider that transfusion is the best hæmostatic known. Hæmorrhage does not tend to begin after a slow transfusion, but rather to cease. Repeated hæmorrhages, such as those from a tonsil bed, become less frequent and do not often recur. Slow transfusion can conveniently be carried out by the technique described by Milroy and Matheson.⁽³⁾

Transfusion for Severe Anæmia which can be Cured Slowly by Specific Medical Therapy.

A complete blood examination should be made in every case of severe anæmia to ascertain the cause. It is primitive medicine blindly to transfuse blood into a patient who is excessively pale. For studying the extent and progress of any anæmia, a hæmoglobinometer is invaluable, especially to clinicians who are not making a special study of hæmatology. The Sahli model is easy to manipulate and accurate even in unskilled hands. The Tallquist method is too inaccurate to be of any use, especially when lower levels are being studied.

It is important to be able to judge the rate of improvement which could be expected with specific medical therapy alone. On an average it is found that when iron is given in severe cases of iron deficiency anæmia the hæmoglobin value increases by 10% per week. It should be remembered that in the presence of sepsis both iron and liver are often slow to exert their therapeutic effect.

Secondary Infection.

Severe anaemia lowers the resistance of the body and secondary infections, particularly pneumonia, are prone to occur. Similarly, operation wounds are slow to heal. It may be wise to shorten the period of lowered resistance from anoxaemia by transfusion, especially in old or debilitated patients.

Recurrence of Haemorrhage.

When a haemorrhage has not been controlled by ligating the bleeding vessel (for example, in the medical treatment of a bleeding peptic ulcer or a haemorrhage from a tonsil bed) it is imperative to prevent the patient from becoming so exsanguinated that a further haemorrhage would probably prove fatal. Transfusion must be employed to maintain a margin of safety. I endeavour to keep the haemoglobin level above 50%, either by a single slow transfusion of 600 to 900 cubic centimetres (one to one and a half pints), or by a massive slow drip transfusion from several donors. By this method as much as five litres (about eight pints) of citrated blood may be given in twenty-four hours. As previously stated (*vide supra*), I consider transfusion reduces the risk of further haemorrhage. It does not promote haemorrhage.

Preparation for Operation.

The problem of preparation for operation has been discussed in a previous paper in a description of the treatment of haematemesis.⁽¹⁾ By the slow massive transfusion of blood a moribund patient can be transformed into one upon whom it is safe to operate within the space of twenty-four hours.

Transfusion for Anaemia for which Transfusion is the Specific Method of Treatment or in which other Specific Treatment has Failed.

The third group contains a number of conditions in which benefit may be derived from transfusion. It is not proposed to attempt to classify these, but merely to emphasize the treatment of one disease. In 1934 Hawksley and Lightwood, of the Hospital for Sick Children, Great Ormond Street, London, pointed out that anaemia of the new-born, *hydrops foetalis*, *icterus gravis neonatorum* and severe haemorrhage of the new-born were closely related.⁽⁴⁾ In an excellent paper these authors advocated repeated blood transfusion to maintain the red cell count above 4,000,000 per cubic millimetre. They considered that the injection of blood intramuscularly was of no therapeutic value, and I agree with them entirely. It does harm by delaying the intravenous transfusion which may be urgently required.

In conclusion may I make a plea for the rational use of blood transfusion. Just as surgery was polluted by the presence of sepsis until the advent of Pasteur and Lister, so will transfusion be fraught with unnecessary risk to human life until we realize the dangers of injecting either incompatible blood or the pyrogenic substances of tap-water.

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OBSERVATIONS ON MORBIDITY IN TROPICAL AND SUBTROPICAL QUEENSLAND.¹

By A. H. BALDWIN.

School of Public Health and Tropical Medicine,
University of Sydney.

THE object of this paper is to endeavour to draw some conclusions from the morbidity statistics of Queensland as to the influence of a tropical climate. Complete morbidity rates are impossible to obtain, except in exceptional circumstances, in which governmental control is strictly exercised, as in navies, armies and prisons, or in such works as the building of canals *et cetera*. Unfortunately, such morbidity rates give us little information of value, as the figures so obtained apply to specialized classes, specially chosen often for their health. Moreover, no independent choice is allowed as regards food *et cetera*. Complete morbidity statistics for the general population of Queensland are of course not available; Queensland in its statistical year book offers the morbidity figures as obtained from the general hospitals. It might be claimed that here again we are dealing with a special class, but it has to be remembered that it has been the definite policy of the State Government in recent years to provide an efficient and complete hospital service for everyone in the whole State, and that large sums have been expended in modernizing the general hospitals by the addition of X ray units, dental clinics, midwifery wards *et cetera*. It is doubtful if in any other State of the Commonwealth the standard of all hospitals, and in particular those of secondary centres, reaches such a high level. As a result a very large proportion of the population becomes hospitalized in the public hospitals and the influence of the private hospitals is becoming increasingly less.

It is frequently claimed that the temperate regions are the home of the civilized races, and that tropical and subtropical climates are not suited to these races. Emphasis is laid on the fact that all the leading nations live in temperate regions. The protagonists of the suitability of the tropics say that the supposed unsuitability of the tropics for civilization is merely a matter of disease, mainly parasitic, and is not climatic, and therefore is capable of being remedied. It has been pointed out

¹ Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1938.

that Rome, although not tropical, could not be regarded as having a temperate climate, and yet she was mistress of the world. Huntingdon suggests that the explanation may lie in that a secular change of climate may take place in, say, 2,000 years, and instances the fact that in ancient times the climate was too cold to grow the olive or the grape. Jones, on the other hand, holds that Rome was quite capable of carrying on till malaria took hold in Italy, and to this fact must be attributed in great part the downfall of Rome. If the superiority of cold climates for civilization now exists, it cannot be claimed that it existed in the past; all the early centres of civilization were in the tropics or close to them, for example Mesopotamia, Egypt and Asia Minor. In the new world we find that the centres of civilization were situated in the warmer regions. The superiority of the cultures in Peru, in Central America and in Mexico was most pronounced when compared with those of the cooler regions of North and South America. The history of Greece, Rome and other centres of culture in the old world, and of certain areas in Central America, suggests strongly that disease and not climate was, and is, the danger to civilized peoples in such areas. The lesson of this is very important to Australia, which has nearly one-third of her total area in the tropics.

When we consider and compare the diseases of the temperate zones with those of the tropics, we find that, with few exceptions, most temperate zone maladies may occur in the tropics, but that, in addition, other diseases, relatively rare or unknown in temperate regions, may occur. Thus fungoid diseases are common in the tropics. So also are parasitic diseases, whether protozoal or helminthic. It is this parasitic group that is very important in the tropics, where many of the diseases demand an insect or an arthropod vector. On account of the nomadic habits of the Australian aboriginal, he seldom stays long enough in one area to reap the fruits of infecting insects in that particular area, and he seldom revisits the locality within sufficient time to suffer any ill-effects from insects previously infected. But let him change his habits, let him take employment at a station, enter a permanent camp, whether governmental or missionary, and the stage is set for his infection and for that of the group with which he is connected. The greatest risk is no doubt run when he congregates with miners in a mining rush, for here are gathered in an overcrowded and generally insanitary area, individuals from far and near, from New Guinea, from Papua and from other areas abounding in malaria. In these camps also the food is generally poor and may on occasions be very scanty; moreover, the heavy toil demanded provides a powerful agent for undermining the natural resistance of those concerned. Such conditions have on many occasions, even in Australia, given rise to small though intense epidemics of malaria.

The factors most profoundly affecting morbidity and mortality in tropical Australia are the climate

and the absence of any considerable numbers of natives living in poor economic circumstances. The habits of such natives as do exist are such as render them not prone to infections or epidemic disease, except when their manner of life has been changed by contact with whites.

In most tropical areas we find conditions very different from these. We find the members of a somewhat dense native population acting as labourers under the general direction of non-indigenous whites; the latter naturally live in fairly close contact with the natives, and share to some extent their liability to the infections and epidemic diseases common to the locality. In most tropical areas malaria accounts for anything from one-third to one-half of the total morbidity, and the reservoir of infection for this disease is found in the younger members of the indigenous population.

In the Australian tropics, however, the scarcity of the native population and its nomadic habits both militate against the possibility of these indigenous inhabitants becoming heavily infected with epidemic or infectious diseases. We can best realize the position by stating that the European in the tropics as a rule lives an artificial life as an administrator. If he is married, his wife, if possible, takes numerous trips home to England; his children are educated in England. He has to maintain a body of servants to minister to his needs.

The European in the Australian tropics lives a very different life. Life in all respects save climate is much the same as that in temperate regions. The white man is born there, grows up there, is educated there, marries and begets children. There are no native races to minister to his comfort, but he has the companionship of his kind, and healthy work and exercise. This no doubt is his salvation. It is the probable explanation of the lack of the neurasthenia seen in other parts of the tropics, and is the reason why experience gained in other tropical areas is of doubtful value when applied to Australian conditions.

It is not within the scope of this paper to discuss tropical climate or its effects on the physiological processes of the human body, but it would be well to indicate briefly the outstanding differences in climate in the Queensland tropics as compared with temperate regions. The subtropics in Queensland occupy an intermediate position between tropical and temperate climates. From a statistical as well as from a climatic standpoint it is convenient to divide the area of Queensland into four divisions. The boundaries of these are fixed by the coastal range and the Tropic of Capricorn. Thus we have a coastal tropical area, an inland tropical area, a coastal subtropical area, and an inland subtropical area.

In the Queensland tropics we have only two seasons, a somewhat short wet season and a longer dry season. The wet season commences as a rule about December and continues for four or five months. During this period a large proportion of the annual rainfall occurs. The heaviest rainfall

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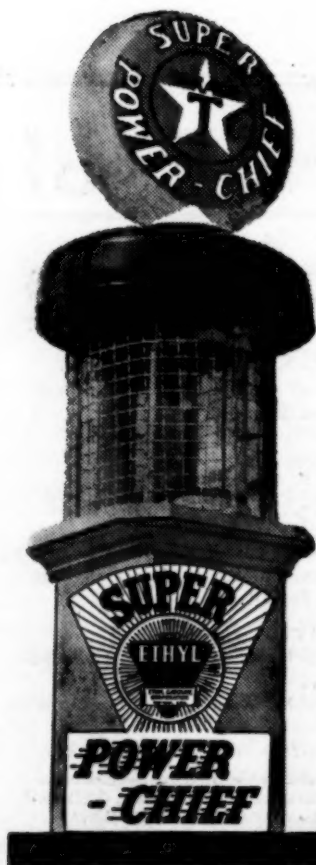
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occurs on the coast and varies from about 40 inches to nearly 200 inches per year, according to local conditions, such as forests, mountains *et cetera*. The maximum temperature in the wet season seldom rises above 95° F., though the relative humidity is high and conditions are disagreeable. In the inland tropical area wet and dry seasons again occur, but the rainfall is much more scanty, falling in the west to the ten-inches annual rainfall line. Dust storms and thunder storms are relatively frequent, and in general day temperatures are much higher and night temperatures are much lower than in the coastal belt.

In the subtropical regions somewhat similar conditions exist, but are modified by the influences bringing about temperate climates. For the purposes of this paper it was considered best to compare morbidity in the tropics and subtropics rather than in tropical and temperate regions. The first reason for this choice was that similar morbidity figures were available only within the State itself. The second reason was that it would seem likely that any changes noted between tropics and subtropics would be still more pronounced between tropics and temperate regions.

In passing it may be mentioned that a greater degree of similarity exists between the two coastal regions, as regards climate, than is the case between a coastal region and its inland area. Moreover, the coastal regions are more densely populated. Thus most of the comparison will be made between the two coastal areas concerned.

In the past a great deal of confusion has arisen concerning morbidity due to tropical climate. Very few diseases are solely confined to the tropics, and even when this is so it often depends on the fact that an insect vector is necessary and that a tropical climate is essential for this insect. Diseases due to a tropical climate itself are probably only few in number: heat hyperpyrexia, heat exhaustion and solar dermatitis. Even these, of course, are met with in temperate climates. Many observers have drawn general conclusions on tropical morbidity from experience gained in one part of the tropics alone. Still worse conclusions have been arrived at in an attempt to predict the course of tropical morbidity by observing the influence of season on morbidity in temperate regions. As illustrating how unwise it may be to generalize, Castellani, in his "Climate and Acclimatization", writes as follows:

In cold climates bronchial and lung affections are more common than in warm climates, while intestinal diseases are more frequently met with in the temperate region. Pneumonia is much more prevalent in winter than in summer, and is found more frequently in cold climates or at high altitudes than in warm climates. Soil dampness favours the development of tuberculosis. Scarlet fever is practically absent in tropical countries.

Most of the statements quoted above are seriously open to question in the Queensland tropics. Bronchial complaints are much more frequent in the tropical area, though pneumonia may be a shade more common in the subtropical area. Digestive

disturbances do seem more common in the subtropics, though even this does not hold in the inland tropical area. Finally, scarlet fever is far from being practically absent, although it is not so prevalent as in the subtropics.

The morbidity rates we shall consider are the public hospital morbidity rates for the year 1934 in Queensland. The following objections may be offered to the use of these for comparative purposes: (i) hospital morbidity figures are unreliable; (ii) the ratio of hospitalized to unhospitalized cases may vary in different areas, or the ratio of those hospitalized in private to those in public hospitals may vary in different areas, or again the ratio of those hospitalized may vary in different diseases; (iii) the figures, being based on one year's experience only, may be liable to considerable errors from chance sampling or from the presence of local epidemics; (iv) the figures are uncorrected for age and sex.

In answer to these objections, as regards variation due to diagnosis differing in different areas, whenever the figures have been checked by diseases reasonably supposed to be unaffected by the incidence of climate or by diet differences, the rates have reasonably approximated in the different areas. In the question of the ratio of hospitalized to non-hospitalized cases, it has to be realized, as already pointed out, that a large proportion of persons are hospitalized in Queensland—how great a proportion we are unable to say; but we can form an estimate by considering the numbers of deaths occurring in public hospitals in comparison with those occurring in the State as a whole.

The percentages of deaths occurring in public hospitals in the four areas are as follows: tropical coastal area, 44.19%; subtropical coastal area, 36.87%; tropical inland area, 52.31%; and subtropical inland area, 37.49%. From this it would be permissible to infer that the public hospitals in the tropics deal with a greater proportion of the total sickness than do those in the subtropics. The percentages also offer us the only available method of allowing for the varying degrees of public hospitalization in the different areas when forming our general morbidity rates. Statistically, of course, there are many objections to such a practice, but it is the only available way at present for correction purposes.

As regards the third objection, that the conclusions are based on one year's experience, this is a valid objection. Unfortunately we have as yet only one year's experience, but numbers will soon accumulate and enable more valuable deductions to be drawn. To counteract any possibility of differences noted being due to chance, in small samples note has been taken only of large differences. As regards local epidemics, two occurred in the tropical area—measles and influenza. Correction should be made for age and sex distribution, but the figures were not available in time. They should not, however, greatly matter.

The crude death rates in the four areas were as follow: tropical coastal area, 8.671‰; subtropical coastal area, 8.673‰; tropical inland area, 9.564‰; and subtropical inland area, 7.457‰. The crude death rate for Australia as a whole for the year 1934 was 9.32‰, and for New Zealand 8.48‰.

On considering these figures we must be struck with the close approximation of the death rates in the two coastal areas. There is a considerable difference, however, in the death rates of the inland areas.

The crude hospital morbidity rates in the four areas are as in Table I.

TABLE I.

	Tropical Coastal.	Subtropical Coastal.	Tropical Inland.	Subtropical Inland.
Crude morbidity rate per 1,000	99.08	71.72	118.96	85.42

Correcting by percentage of hospitalization, we get corrected rates as in Table II.

TABLE II.

	Tropical Coastal.	Subtropical Coastal.	Tropical Inland.	Subtropical Inland.
Corrected rates per 1,000	204	195	227	228

This gives a better idea of the forces of morbidity in the four areas.

We see now, as regards the coastal areas, that the mortality rate is almost the same in each, and the morbidity is a little higher in the tropics, though it is doubtful if this would be significantly different over a number of years. We find less morbidity in the coastal areas than in the inland areas, and we find that the morbidity in each inland area is almost exactly similar, but the death rate is lower in the subtropical inland areas. In any one disease it is easy enough to obtain a public hospital morbidity rate, that is, the number of cases treated in public hospitals per 100,000 of population. We might, then, correct this rate to express it as a rate for those sick, not only in public hospitals, but also to include those sick and not attending public

TABLE III.
Percentages of Sickness to Total Sickness.

Class of Disease.	Area.			
	Tropical Coastal.	Sub-tropical Coastal.	Tropical Inland.	Sub-tropical Inland.
Parasitic and infectious ..	16.9	11.8	9.9	11.1
Diseases of the nervous system ..	5.2	7.4	7.0	6.1
Diseases of the circulatory system ..	5.0	5.8	5.0	4.6
Diseases of the respiratory system ..	8.5	8.8	10.5	10.1
Diseases of the digestive system ..	20.6	25.5	25.8	29.2
Diseases of the genito-urinary system ..	9.0	10.7	9.0	7.8
Diseases of pregnancy and labour ..	3.6 ± 1.1	3.0	3.4	3.5
Diseases of the skin ..	5.7	3.6	5.7	4.9
Accidents <i>et cetera</i> ..	15.9	10.9	29.3	13.7

hospitals. A crude way of doing this is to obtain the ratio of those dying in public hospitals from any one disease to those dying in the State from the same disease. This method has the great objections that when the cases of disease are few there is a large element of error, and again, when deaths are infrequent, as in, say, skin infections, a correct ratio is impossible to obtain. It has been considered, therefore, that the best corrective factor to apply to every disease is the ratio obtained by comparing the total deaths in public hospitals in any one area with the total deaths in that particular area for all diseases.

An address of this nature is ill-suited to discussing the three or four thousand individual rates on which the observations mentioned in this paper have been based; it has been thought best, therefore, to discuss the main differences noted and to embody the rates as a table in an appendix.

In the Queensland figures we have, under the four areas, morbidity grouped first into eighteen main classes, as for example, diseases of respiration, diseases of pregnancy, labour *et cetera*. Next they are subdivided among the 200 headings of the international list of causes of death. Except when it is otherwise stated, disease rates have been calculated per 100,000 of population, except in diseases of pregnancy and labour, when the rate has been calculated per 100,000 females. Most attention has

TABLE IV.
Morbidity Rates per 100,000 Crude and Corrected by Degree of Hospitalization in the Four Areas.

Class of Disease.	Area.							
	Tropical Coastal.		Subtropical Coastal.		Tropical Inland.		Subtropical Inland.	
	Crude.	Corrected.	Crude.	Corrected.	Crude.	Corrected.	Crude.	Corrected.
Parasitic and infectious	1,076	3,788	846	2,293	1,180	2,256	945	2,521
Diseases of the nervous system	513	1,159	529	1,434	836	1,598	522	1,392
Diseases of the circulatory system	498	1,125	418	1,133	596	998	392	1,046
Diseases of the respiratory system	843	1,906	631	1,710	1,246	2,382	862	2,299
Diseases of the digestive system	2,044	4,619	1,836	4,959	3,065	5,860	2,491	6,645
Diseases of the genito-urinary system	892	2,016	769	2,084	1,067	2,040	666	1,782
Diseases of pregnancy and labour ¹	688	1,555	437	1,184	929	1,776	650	1,734
Diseases of the skin	560	1,266	271	634	679	1,298	417	1,112

¹ Rate per 100,000 females.

been directed to the differences between the two coastal areas, tropical and subtropical, and unless it is otherwise stated comparisons will refer to these areas when the terms tropical and subtropical alone are used.

When we consider the main classes of morbidity we find in each of the four areas that diseases of the digestive system are more frequent than any other class of sickness. In the coastal areas the tropical has a lower percentage than the subtropical. Thus 20.6% of all sickness is of this nature in the tropics, and 25.5% in the subtropics. About the same percentage holds for the inland areas, but it is somewhat higher, for example the tropical inland rate is 25.8% and the subtropical inland rate is 29.2%. The corrected rate for the tropical coastal areas is 4,619 per 100,000, and for the subtropical coastal area 4,959.

When we come to the next class of disease, accounting for a high degree of sickness, we find variations in the four areas. In the coastal areas it is the parasitic and infectious disease class, wherein the tropical coastal area includes 16.9% of its sickness, and the subtropical coastal area 11.8%. The percentages in this group are complicated by the fact that in this year the tropical areas experienced a large influenza outbreak, and the south had only a much smaller one. The tropics also experienced a measles epidemic, whereas the south had a much higher diphtheria rate. A great deal of the morbidity is accounted for by accidental injuries, wounds *et cetera*. This is more pronounced in the tropics. In the coastal regions it is the largest cause but two of morbidity, accounting in the tropics for 15.9% of hospitalization, and in the subtropics for 10.9%. In the inland regions it ranks second as a cause of morbidity, with 20.3% in the tropical inland and 13.7% in the subtropical inland. In the coastal regions genito-urinary disease ranks next or fourth in importance, accounting for 9.0% of sickness in the tropical area and 10.7% in the subtropical area. The corrected rates for diseases of the genito-urinary system in these areas per 100,000 are 2,016 and 2,084 respectively. In the inland areas, tropical and subtropical, the percentages are less, being 9.0% and 7.8% respectively. Respiratory diseases account for about 8.5% of sickness in both coastal areas and a little over 10% in both inland areas. Two other classes of disease only deserve mention, namely, diseases of the skin and diseases associated with pregnancy and labour. We find in the tropics a much greater tendency to diseases of the skin. Epithelioma and other tumours are not included in this group, which comprises mainly carbuncles, acute abscess and cellulitis. Diseases of pregnancy and labour are higher in tropical areas, and much more so when the degree of masculinity is allowed for. A corrected rate is difficult to determine; the crude rate per 100,000 women for hospital cases is 688 for the tropical coastal and 437 for the subtropical area. If we correct this by comparing the number of patients who died from these causes in hospital and in the

State as a whole, we obtain corrected rates of 1,555 for the tropical coastal and 1,184 for the subtropical coastal areas. But these diseases are particularly dangerous to which to apply such corrections, for in them death may occur quickly in an emergency. It then depends on transport and distance how many such women die in hospital. In the inland areas the figures are worse, the tropical area still showing the higher morbidity.

Finally we must consider a few diseases individually rather than in groups. In the parasitic and infectious group the main interest centres in scarlet fever. It is often claimed that this is practically absent from the tropics. The figures indicate that this is not so; the rate (46) is certainly less than the 164 of the subtropical areas, but is greater than the rate for syphilis in its own area. Typhoid and paratyphoid fevers are more prevalent in the tropics than in the subtropics. Leprosy is more frequent, though insignificant.

In dealing with purulent and septic processes we find an extraordinary prevalence in the tropical area. The tropical coastal area rate is 655, and that of the subtropical is only 233. The inland area rates are much on the same level, and intermediate in magnitude between tropical and subtropical coastal areas. Malaria had a particularly high rate this year in the tropics on account of a brisk little mining epidemic. Weil's disease occurred to any great degree only at Ingham, in the tropical coastal belt. Mycotic diseases, although accounting for but little morbidity, definitely showed increased prevalence in the tropics, with a rate of twelve against the two of the subtropics. Sickness due to cancer and to other tumours was very similar in the two coastal areas, but if anything seemed to be less in the tropics. Acute and chronic rheumatism are most interesting. The statement is sometimes made that these are much more prevalent in cooler regions. Acute rheumatism was almost 50% more frequent in the tropical area, with a rate of 214 compared with 157 for the subtropics. Chronic rheumatism shows similar tendencies; the rates are 194 and 152 respectively. There seems less diabetes in the tropical coastal area than in the subtropics; the rates are 86 and 137 respectively. The inland areas do not follow this trend, for the tropical area has the higher rate.

The most striking difference in rates observed occurs with regard to alcoholism, acute and chronic. The tropical area has a rate of 572 compared with 189 for the subtropics. The rate for the diseases listed as *dementia præcox* and other psychoses is of interest. It is often claimed that this rate should be higher in the tropics. The rates as calculated work out at 58 for the tropics and 185 for the subtropics. Arteriosclerosis is more common apparently in the subtropics, the rate being 47 in the tropical coastal area and 136 in the subtropical coastal area. It has also been claimed that varices and hemorrhoids are more common in the tropics; this is apparently borne out, the rate in the tropics being 159 and in the subtropics 116.

A statement very frequently made is that bronchitis is uncommon in the tropics. The rate for bronchitis, both acute and chronic, is high in the coastal tropical area and still higher in the inland tropical area. The rates are as follows: inland tropical area, 1,012; coastal tropical area, 802; inland subtropical area, 633; and coastal subtropical area, 417. Pneumonia, and in particular lobar pneumonia, seems more common in the subtropical region.

Langan, of Cairns, and other northern practitioners claim that appendicitis is more frequent in north Queensland and that it appears to have a seasonal incidence in the wet season. As far as the figures go, the rates for appendicitis support this theory. They are the following: tropical coastal area, 1,098; subtropical coastal area, 954. For many years tropical authorities have claimed that urinary calculi are more common in those regions. The rates for this complaint support their opinion: the tropical coastal rate is 172 and the subtropical coastal rate is 131.

The tropical area has an undue incidence of disease connected with pregnancy and labour. Abortion without septic conditions is much more frequent in the tropics, with a rate of 1,200 (per 100,000 females) as against 862 in the subtropics. The toxæmias of pregnancy also have a greater incidence.

Briefly summing up the main differences in morbidity in the two areas, we find in the tropics: (i) a greater tendency to parasitic and infectious disease, (ii) a greater tendency to purulent and septic processes, (iii) a greater tendency to mycotic disease, (iv) a greater tendency to rheumatic infections, (v) a very heavy rate for alcoholism, (vi) a greater tendency to disease of veins, (vii) a greater tendency to bronchitis, acute and chronic, (viii) a greater tendency to urinary calculi, (ix) a greater tendency to disorders of pregnancy, (x) a very great increase in accidental injuries, and (xi) a lessened tendency to diabetes, to scarlet fever, to certain nervous disorders and to arteriosclerosis. It would appear that in the tropics skin and mucous membrane offer a less effective barrier to infection, particularly of a coccal nature.

The diseases demanding reduction most urgently, because of the morbidity due to them, are the complications of labour and pregnancy, alcoholism and accidental injuries. Despite the differences pointed out, the morbidity in the tropics is little higher than that in the subtropics, and the crude death rate is exactly the same. The tropical climate in Queensland seems to produce only minor differences in morbidity rates, and these not of the nature that are usually ascribed to tropical climates. The observations in this paper are not conclusions; they are meant to be indicative only. Time alone will accumulate sufficient figures to confirm or deny the truth of any differences in morbidity noted.

INDICATIONS FOR INTERFERENCE DURING LABOUR.¹

By ARTHUR M. WILSON, D.S.O., M.D., B.S., F.C.O.G.,
Melbourne.

IN order to lessen the field of this paper, the discussion has been limited to those cases in which the indication for interference has resulted from a breakdown of the obstetrical mechanics and machinery in the delivery of a fœtus which has presented by the cranial vault. In addition, the discussion on which method of interference is indicated is strictly limited.

In labour the border-line between the physiological and the pathological is very slender, and by insensible degrees the normal case may drift into the abnormal. Watchful expectancy and masterly inactivity have long been lauded as the keynote of successful obstetrics, and rightly so, providing that the labour is proceeding along normal lines. If the condition has become pathological, a similar policy framed on "Micawberish" lines has caused many obstetrical disasters. The first essential, therefore, for the obstetrician, is to be able to diagnose at once the appearance of the abnormal, and also to estimate its gravity.

The successful termination of any case is dependent on many factors, which may be enumerated as follows: (i) the relationship of the size of the presenting fetal part to the size of the maternal pelvis, (ii) the presentation, (iii) the position, (iv) the time at which the membranes rupture, (v) the mouldability of the fœtal skull, (vi) the dilatability of the maternal soft parts, and (vii) the strength of the uterine pains.

If all the factors are favourable, the labour will terminate successfully. One or more may be unfavourable, and with varying degrees of intensity. One very unfavourable factor may render the successful termination of the labour quite hopeless from the start. Alternatively, some very favourable factor may counterbalance one or more unfavourable factors. From the possible permutations and combinations of these factors, favourable and unfavourable, it will be seen that the possibilities of any labour are unlimited.

The Appearance of the Abnormal in the First Stage of Labour.

If the machinery is working efficiently, a *primipara* should complete her labour within twenty-four hours, and a *multipara* in about half that time. If the machinery is inefficient (particularly I mean the strength of the uterine pains), this time may be lengthened, and unfortunately undue importance is attached to this by the laity. A labour can be likened to a mile race—"go as you please". Some patients dash from the start and are exhausted long

¹ Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

before the finish. Others decide to crawl the whole distance, to the distraction of their relatives; but these patients arrive at the post in excellent condition. It is therefore most important that the diagnosis of maternal distress should be made by the obstetrician and not by the anxious relatives.

Woe betide the obstetrician who, yielding to the importunities of the relatives, attempts to deliver his patient before she is ready! So long as the labour is advancing she is much better left alone, aided, of course, by the liberal use of sedatives to carry her through her trial. Barnes very succinctly remarked: "During labour it should be the aim of the obstetrician to observe what the patient can accomplish, not what she can endure."

Diagnosis of the Onset of Labour.

If there is any doubt about the onset of labour, it is much better to inform the patient and her relatives that the pains are premonitory and may or may not drift into the real thing. In the doubtful case the fixation of an exact time gives the relatives a very accurate starting point for their calculations of "the time factor".

The Cause of Inefficient Pains.

Undoubtedly the most important factor in inefficient labour pains is fear on the part of the patient, a fear very often carefully fostered and nurtured by "the lady next door", and also, I regret to say, in some cases by the obstetrician. The inventor of the term "elderly *primipara*" has much to answer for. In my own practice, if the very rich, very poor and Jewesses are excluded, the average age of the *primipara* is thirty-two years. Most of these patients are terrified by having been informed that they are too old to have a first baby, and if their fears are confirmed by the medical attendant, then a long, slow labour with inefficient pains is practically certain. Every *primigravida* really undergoes a "trial labour". It is important that the obstetrician should be able to diagnose whether the labour is proceeding satisfactorily or not.

The First Stage of Labour with Membranes Intact.

During the first stage of labour, if the membranes are intact, the obstetrician may decide whether the signs are favourable or unfavourable according to the following tabulation.

Favourable.	Unfavourable.
Abdominal Palpation.	
Head and anterior shoulder descending.	Head and anterior shoulder descending.
Pelvic Palpation.	
(a) Cervix "taking up" with head fitting into it and head descending.	Cervix not "taking up" and head not fitting in.
(b) Head well flexed, posterior fontanelle lowest and occiput rotating to front.	Head extending, anterior fontanelle felt, sagittal suture lying transversely.

As long as the membranes are intact the labour may be allowed to go on. The mother may tire, but

the labour cannot be said to be obstructed; there is no risk of tetanic contractions, and no risk of a ruptured uterus (provided that the uterine wall is not diseased) and the fetus is reasonably though not absolutely safe. Many authorities maintain that the labour may be allowed to go on indefinitely if the membranes are intact, but when the cervix is fully or almost fully dilated I am of the opinion that the membranes should be artificially punctured. No trial labour is complete unless the patient has four hours of labour after the rupture of the membranes, for then the uterus exerts a direct pressure on the fetus; and with the altered conditions not infrequently a great advance is made and an apparently hopeless case is converted into one in which easy delivery is possible.

Membranes Ruptured Before, at the Onset of, or Early in the First Stage of Labour.

Rupture of the membranes at the onset of or early in the first stage of labour is one of the most unfortunate complications and is frequently associated with some other unfavourable factor, particularly slight disproportion, a posterior position of the fetus and malpresentation, and inefficient pains. With a combination of such unfavourable factors, unfortunately, no matter how competent and patient the obstetrician is, the labour may end in failure. By failure I mean an exhausted and lacerated mother and a stillborn baby. The obstetrician, however, has no option but to wait patiently as long as the labour is advancing before he undertakes any interference.

Signs of Obstructed Labour.

It is important to make an early diagnosis of obstructed labour; indeed, all preparations for interference should be made whilst the obstruction is threatening. The signs may be classified as follows: (a) maternal, (b) fetal.

Maternal distress is present when it is found by abdominal palpation that there is no further descent and when it is found by pelvic palpation that the head is not descending and that the cervix is not dilating and is becoming oedematous. General constitutional signs and local signs in the uterus are also present. These signs will be described in detail here. Signs of fetal distress are: (a) a heart rate below 120 or over 160 in between the pains, and irregularity of the heart beat; and (b) the passage of meconium.

The passage of *liquor amnii* stained with meconium is too often regarded as a sign of fetal distress. Moreover, before the obstetrician interferes because of fetal distress he must consider very carefully. If the head is still high and the cervix is not fully dilated, interference resulting in a difficult forceps delivery will certainly do the fetus harm and take away what chance of survival it still has; and interference by operative means will subject the mother to risk for a child whose viability is already problematical.

Indications for Interference during the First Stage.

I shall discuss three indications for interference during the first stage of labour. They are: (i) definitely obstructed labour, (ii) slow labour, and (iii) foetal distress.

If labour is correctly diagnosed as being obstructed, then interference is indicated. Fortunately, this condition, apart from gross abnormalities and tumours, is very rare in our Australian women, of whom not more than 1% have a contracted pelvis.

A debatable point is whether any interference is justified in the "slow labour". The commonest causes of the slow labour are: (a) a slight disproportion, a minor degree of pelvic contraction, or more often an outsize foetus, not infrequently post-mature; (b) premature rupture of the membranes; (c) posterior position of the foetus; and (d) poor dilatability of the maternal soft parts.

In the first and second of these conditions, so long as the labour is advancing no interference is indicated. With a posterior position of the foetus it must be remembered that in all cases most of the forward rotation occurs during the second stage of labour. The head may be entering the pelvis with its sagittal suture lying transversely because there is more room in that diameter; therefore it is wrong, both in theory and in practice, to try to rotate the head and so make its entry into the pelvis more difficult. If the maximum diameter of the head is in the mid-pelvis and has pushed the cervix in front of it (this is invariably associated with early rupture of the membranes), it may be justifiable to rotate (and flex) the head to a more favourable position and then to allow the labour to proceed until the cervix has fully dilated and the patient has reached the second stage of labour.

Non-Dilatability of the Maternal Soft Parts.

Non-dilatability of the maternal soft parts is most often merely a sign of other unfavourable factors, particularly of inefficient uterine pains and of premature rupture of the membranes. Age is not nearly such an important factor as both the profession and laity believe. In such cases patience and sedatives usually result in dilatation of the cervix. In nearly every case the cervix will ultimately reach at least three-quarters dilatation. In such cases, if the mother and foetus are showing signs of distress and if the maximum diameter of the head has entered the pelvis, it is justifiable to stretch the cervix manually and complete the delivery. However, to attempt to dilate the cervix manually from less than half dilatation or to attempt to deliver the head when it is high is simply courting disaster.

Foetal Distress.

Foetal distress has already been discussed in this paper. A well-considered opinion is very necessary on this point, but it is well to remember that a "high forceps" operation will kill the majority of babies and may in addition land the obstetrician in the worst of obstetrical disasters, that is, in the

"failed forceps" operation. If the head has entered the pelvis, very occasionally the situation may be improved by rotating the head manually and then allowing the labour to proceed.

Interference during the Second Stage of Labour.

The indications for interference during the second stage of labour are the same as for interference during the first stage. They are: (a) maternal distress, (b) foetal distress, and (c) delay in the second stage.

Interference during the second stage practically means the application of forceps. I have yet to see the patient who, if the maximum diameter of the head has passed the inlet, cannot be delivered by forceps. The so-called contraction of the outlet without contraction of the inlet I regard as an obstetrical curiosity.

The third indication is important only because the case resolves itself into one of foetal or maternal distress. The commonest cause of delay in the second stage of labour is a posterior position of the foetus in which the forward rotation of the occiput is delayed. The uterine pains push the usually slightly extended vertex past the mid-pelvis down to the bony outlet. If the occiput rotates backward or, more correctly, if the anterior fontanelle rotates forward, there is much more chance of a spontaneous delivery than if the sagittal suture lies transversely across the bony outlet. If the occiput does not rotate forward, the head becomes impacted at the outlet, as the occipito-frontal diameter, 11.25 centimetres (four and a half inches), is greater than the transverse diameter of the outlet, 10.0 centimetres (four inches), which gives rise to the so-called "deep transverse arrest of the head". The head will remain almost indefinitely in this position unless helped out by the obstetrician. The interference required is the rotation of the head manually or with forceps and completion of the delivery with forceps. The possible forceps operations may be classified as follows: (a) high forceps operation, with the maximum diameter of the head not yet past the pelvic brim; (b) mid-forceps operation, with the maximum diameter of the head in the mid-pelvis; (c) low forceps operation, with the maximum diameter of the head at the bony outlet; and (d) the "head on perineum" operation, in which the maximum diameter of the head has passed the bony outlet and the cranial vault is distending the perineum.

The high forceps operation is mentioned only to be dismissed.

Most cases of deep transverse arrest of the head are included in the mid-forceps operation class. If the occiput is rotating and there is no foetal or maternal distress, it is better to let the labour proceed further, as even with this operation there is a slight increase of risk to the mother and to the foetus.

It should be the aim of the obstetrician to allow all his patients to reach the "low-forceps" stage

before interference, and even then it is hardly justifiable if the patient can do more for herself.

I mention the "head on perineum" type of forceps operation, because in a discussion of this nature, in which I consistently preach the doctrine of non-intervention, frequently I am asked: "In what proportion of cases do you effect delivery with forceps?" To this I reply: "In about 75%; but of these, 90% are of the 'head on perineum' variety." I believe that this type of operation is practically devoid of risk to the mother and to the child. I may be asked: "If the patient can go so far, why not let her go the whole distance?" My reason is that to all my patients in labour I give sedatives in the early stages, and an anæsthetic when the delivery is being completed. An anæsthetic of sufficient depth to keep a *primipara* still definitely weakens the pains, and so the obstetrician, to complete the delivery, must use either the "head on perineum" operation or a few minims of pituitary extract, both manœuvres being frequently combined with episiotomy—a very favourable procedure.

Artificial Rupture of the Membranes.

In a *multipara*, when the cervix has just reached full dilatation and when the position and presentation are favourable, a few minims of pituitrin will usually complete the delivery, even though the patient is under moderately deep anæsthesia.

Interference during the Third Stage of Labour.

Hæmorrhage is still the most common cause but two of death in childbirth, the hæmorrhage in the majority of cases being *post partum*. Most conscientious obstetricians believe that patients should not die of hæmorrhage and that the common cause of *post partum* hæmorrhage is mismanagement in the third stage of labour. It is astonishing how many obstetricians are prepared to wait two to three hours for the arrival of the baby, but are not prepared to wait two to three minutes for the arrival of the placenta. The natural contractions of the uterus will expel the placenta much more satisfactorily than any effort on the part of the practitioner. Interference is definitely not indicated at this stage.

Post partum hæmorrhages are almost invariably of the atonic variety, very rarely traumatic. In managing the atonic variety in which but little hæmorrhage occurs whilst the placenta is still in the uterus, the treatment is to sit by and wait. Premature attempts to squeeze out the placenta by Credé's method often result in shock to the patient, in the partial separation of the placenta, and in free hæmorrhage; then the obstetrician bemoans his misfortune, overlooking the fact that he has started the *post partum* hæmorrhage.

In managing the atonic variety in which there is hæmorrhage, usually a persistent trickle, particular treatment is indicated. This hæmorrhage means that there has been partial separation of the placenta. The treatment then is to complete the separation before the patient becomes exhausted and exsanguinated.

A Credé's expression is the first manœuvre. If this fails after a few attempts it may be successful if the patient is put under an anæsthetic. Always remember that repeated attempts at Credé's expression cause a great deal of shock to the patient. If the hæmorrhage continues, the placenta must be removed manually. Unfortunately in all teachings the dangers of manual removal are emphasized so strongly that many practitioners are nervous of the result, and its performance is unduly delayed.

Without in any way attempting to minimize the risk of a manual removal, I should like to point out that the persistent loss of blood is rapidly pulling the patient into a more and more serious condition. Manual removal of the placenta with the patient still of good colour and with a pulse rate under 100 is not very dangerous. The risk of the manœuvre in an exsanguinated patient with a pulse rate of anything from 140 to 160 is appalling. Therefore, make up your mind early. Manual removal of the placenta is not very often necessary. In a series of 3,000 consecutive cases at the Women's Hospital, Melbourne, the incidence was 1 in 120, and I regard this figure as a trifle high.

If the uterus is properly emptied the hæmorrhage from the atonic uterus can usually be controlled unless the patient is *in extremis*. The methods to be adopted will be found in all obstetric text-books. I should like to add a plea for patients to be treated according to the ordinary rules of surgery. As a consultant I see many patients with *post partum* hæmorrhage, and almost invariably they are suffering as much from shock and collapse as from loss of blood. They are sometimes found lying in a pool of blood and liquor from their heels to their necks. About three-quarters of their surface area is exposed to the four winds of heaven, and they are extremely cold and shivering. In such cases I have disappointed their attendants by doing nothing more for the patient than getting her out of the mess, putting on a tight binder and giving her a dose of morphine.

Reports of Cases.

BILATERAL CONGENITAL DISLOCATION OF THE HEAD OF THE RADIUS.

By THOMAS ROSE, M.B., B.S. (Sydney).
Resident Medical Officer, Newcastle General Hospital.

Case History.

THE patient concerned was a male of Jewish birth, aged thirteen years, and he was referred to Saint Vincent's Hospital, Sydney, with the following history. Three days prior to admission to the hospital he injured his right elbow in an unsuccessful attempt to grasp the hand-rail of a quickly moving omnibus. He was dragged along

the ground, still clinging to the vehicle, and he experienced severe pain in the right elbow. The pain persisted and he consulted a medical practitioner, who diagnosed the injury as a traumatic dislocation of the head of the radius. Reduction was easily performed, but the deformity immediately recurred. The patient had never noticed anything abnormal about his elbows, nor suffered any inconvenience from them until this accident. His mother stated that his elbows seemed to be slightly deformed in the last five years.

The previous history revealed that he had been undergoing treatment for a congenital stricture of the urethra with a diverticulum of the bladder for the past five years.

Examination revealed a thin boy, six feet in height, with badly developed musculature. Inspection of both elbows revealed a prominence, more pronounced on the right side, lateral to and in front of the lateral epicondyle of each humerus, with a corresponding depression over the normal location of the head of the radius. *Cubitus valgus* was present in both elbows, 20° in the right and 25° in the left, whereas the normal carrying angle is 10° in full extension. On palpation the prominences were found to be the heads of the radii dislocated forwards and laterally. They could be easily pushed into their normal position, but immediately became dislocated again. Deep tenderness was elicited over the lateral aspect of the right elbow joint. In the left elbow full movements were present. In the right elbow there was 45° of limitation of active flexion and 10° of limitation of full extension. Pronation and supination were possible to the extent of only a few degrees on either side of mid-pronation. This limitation of movement was due to the pain incurred on both active and passive movement of the joint. There was also abnormal side-to-side movement of the joints, 40° in extent. The musculature of both arms was ill-developed, in keeping with the general bodily development. There was no involvement of the function of the nerves of either arm. Measurement of the arms revealed that they were of equal length and of equal girth at corresponding points. A careful search of the rest of the osseous and articular system revealed no further abnormality. The other systems were clinically normal, excepting the urinary system. Examination of the urine revealed albumin and pus cells with a few motile bacilli. A urethral stricture was present in the penile urethra near its junction with the membranous portion. This was not investigated further, as the patient was undergoing treatment for this condition at another hospital.

Dr. B. P. Anderson-Stuart's radiological report on the elbow joints was as follows:

The head of the right radius is dislocated laterally and anteriorly. The same condition is present to a lesser degree on the left side. The bones of the elbow joints are very large for a child of thirteen years. This is mainly at the ends of the bones adjacent to the joint, and is particularly evident in the case of the ulnæ. The epiphyses are flattened and large, but this is probably in part congenital, in part due to mechanical changes resulting from the conditions.

Radiographs were made of the other epiphyses of the osseous system without anything abnormal being discovered. In view of the height and build of the patient a radiograph of the pituitary fossa was made, but revealed nothing unusual.

A Wassermann test of the blood gave no reaction, and the serum calcium and phosphorus values were within normal limits.

The diagnosis was made of bilateral congenital dislocation of the head of the radius, complicated by a sprain of the right elbow joint.

As the left elbow was causing no inconvenience no treatment was adopted for it. The right elbow was rested by a sling round the forearm and neck. The sling was shortened daily until full painless flexion was obtained, and was then gradually lengthened each day until full movements of the elbow, including pronation and supination, were present. This occurred three weeks after the accident.

Discussion.

This case is reported because of the rarity of congenital dislocation of the head of the radius. Most of the standard surgical text-books either do not mention its occurrence at all or give it only a passing reference.⁽¹⁾ Power⁽²⁾ stated that Bonnenberg collected reports of thirty cases, of which only twelve were bilateral. Whitman⁽³⁾ refers to fifty-three cases, details of which were collected by Blodgett. The association of this abnormality with congenital stricture of the urethra must be very uncommon, and there appears to be no reference to it in the available literature.

Congenital dislocation of the head of the radius may be complicated by radio-ulnar synostosis, the two bones of the forearm being fused just below their upper ends.⁽⁴⁾ No evidence of this was present in this patient.

There may be a familial history in these cases. Abbott⁽⁵⁾ reports a series of seven cases in one family over four generations. Such a history was not obtainable in the present instance.

As regards the possible aetiology of this condition, Power⁽⁶⁾ states that Herskovits suggested injury to the belly of the mother, or excessive muscular activity of the fetus, or some peculiar fixation of the limbs *in utero*. No satisfactory conclusion has been reached as yet. The remarkable age-height discrepancy of this patient, who was six feet tall at the age of thirteen, together with his spare build and badly developed musculature, makes one suspect some general glandular dysfunction, possibly of pituitary origin, though whether this has anything to do with the condition of the elbows it is impossible to say.

A practical point to be learnt from this case is the necessity for examination of the opposite side in any case of injury to a limb. In this instance a dislocation of the head of the right radius was apparently due to trauma. Examination of the opposite elbow revealed an identical deformity and revealed the true diagnosis.

Acknowledgement.

I am indebted to Dr. D. J. Glissan, honorary orthopaedic surgeon to Saint Vincent's Hospital, for permission to report this case, which came under my notice while I was senior resident medical officer at Saint Vincent's Hospital, Sydney.

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Reviews.

FRACTURES.

THERE was a time, not long ago, when very little serious attention was given to fractures. Their problems were neglected, treatment was crude, and results were a discredit to surgery. A small book of 133 pages, a "Brief Outline of the Modern Treatment of Fractures", by Dr. H. W. Spiers, now in its second edition, shows what a change has been wrought in a few years. Notwithstanding its small size, it is a successful book of instruction, containing just the information wanted by student, hospital resident and general practitioner. Its success is due firstly to the obvious fact that Dr. Spiers knows, as a practical man, what he is talking about, and secondly to his knowing how to say it in comparatively few and yet sufficient

¹ "A Brief Outline of Modern Treatment of Fractures", by H. W. Spiers, A.B., M.D.; Second Edition; 1937. London: Baillière, Tindall and Cox. Medium 8vo, pp. 146, with illustrations. Price: 9s. net.

words. This is done by directness, simplicity and method. There is nothing really new in the treatment, but the methods chosen and described are well accredited, and, when carefully followed, they can be expected to give the best possible results, though it will often enough be found that the best possible is not all that everyone could wish. All recent teaching has been influenced by Böhler, and on the whole much to the good, though we remain critical as to some of that surgeon's methods. One of the improvements in teaching of recent years that is in no small degree due to Böhler has been the very general recognition that the plating of fractures of the long bones is not good surgery, and never was. While Dr. Spiers is evidently of the same opinion, he recommends operative interference of other kinds in various difficult cases. Readers will find these cases discussed, and experienced surgeons will in general agree with the treatment recommended. We agree with his suggestions about operative interference in certain ankle fractures with difficult displacements, but the practitioner should be warned that rectification is not easy even then, nor are results more than very moderately satisfactory. But while we have so much to commend, there is some criticism of another sort. Dr. Spiers' statement that fractures of the patella are usually produced by direct violence, and that the fracture (by direct violence) is most frequently transverse, is in direct contradiction to general experience. Transverse fractures are common, perhaps the commonest; but transverse fractures, with rare exceptions, are produced by muscular contraction, not by direct violence. Our criticism does not extend to the treatment.

We noticed one other thing that we cannot pass without remark. It is a pity that illiteracy should betray itself so often in the work of medical authors, but it does. It grates on us to read such a sentence as this, on page 80: "The gravity of such injuries to a viscera is so great that the fractures are secondary."

THE PRACTICE OF MEDICINE IN THE EARLY DAYS OF NEW SOUTH WALES.

THE publication of Dr. K. Macarthur Brown's book on "Medical Practice in Old Parramatta" is most opportune. At a time such as the present, when everyone is interested in the early history of New South Wales and numerous articles are appearing in the local papers when a flood of pamphlets and books is being published describing the great deeds of the pioneers, the medical men of the early days have received little or no mention. It is good to read in Dr. Brown's book how great a part the early medical practitioners played in helping the infant settlement to grow into the present great nation.

The history of Parramatta is almost contemporaneous with that of the parent city, Sydney. Only one year and a few months after the landing, Captain Phillip founded the town of Parramatta at Rose Hill, and with it the first hospital outside Sydney.

With the early days of this hospital were associated many famous medical men: Arndell, who soon forsook medicine for pastoral pursuits; John Harris, of Ultimo; D'Arcy Wentworth, whose period of office in Parramatta was marked by many improvements in the care of the patients and in hospital administration.

The early days in Parramatta were troublous and the life of the local medical men hard and unprofitable, and they can hardly be blamed if most of them endeavoured to augment their miserable salaries by indulging in farming and other pursuits, with the result that at times urgent calls were not answered as promptly as they should have been. Another source of trouble was the numerous duties which the surgeon was called upon to perform. He was expected to attend to the military, the orphan institution

and the convicts, and in addition to look after a private practice scattered all over a large district, in which roads were of the most primitive type, if they existed at all. The result was that conditions at the local hospital went from bad to worse. Dr. Brown quotes from a letter written by the Reverend Samuel Marsden. The latter tells us that the patients were left without the commonest necessities for months at a time.

This state of affairs was remedied in 1818 by the building of a new hospital, and in 1821 Dr. Henry Grattan Douglass was appointed as medical officer to the settlement.

The name of Dr. Grattan Douglass deserves to be remembered by all Australian medical men, for during his five years at Parramatta he did much good work. Dr. Brown gives us a most amusing account of a feud which arose between Samuel Marsden and Douglass: "the pawn in their game was a convict maid, physically perfect, but morally beyond recall". It is impossible to quote the story in full in a review, but the story is well worth reading, as it makes one realize what good fighters there were in those "good old days".

Douglass deserves well of us, as he was one of those medical men who stood at the side of William Charles Wentworth in the fight to obtain a constitution for the people of New South Wales. In this regard he may be placed with William Bland.

The years pass on, and in 1829 we find in the person of William Sherwin the first qualified medical practitioner to enter private practice in Parramatta, to be followed in 1832 by Robert Champey Rutter.

In referring to William Sherwin, Dr. Brown makes two statements which we think are inaccurate. The first Australian student to proceed to England to study medicine was Henry Cowper, who in 1814 was apprenticed to William Redfern and in 1823 sailed in His Majesty's ship *Dromedary* to undertake post-graduate study. He returned to Sydney in 1823, having taken the diploma of M.R.C.S., thus antedating Sherwin by three years. According to the roll of the Royal College of Surgeons of England, Sherwin did not proceed to the F.R.C.S. until 1862, and in a recent article entitled "How Surgery came to Australia", Sir D'Arcy Power states that the first Fellow of the Royal College of Surgeons of England to settle in New South Wales was Arthur Martin A'Beckett, who came to Sydney in 1839 and was elected F.R.C.S. in 1855; the second being Charles Nathan, whose fellowship dates from 1857.

Dr. Brown enlivens his narrative with many interesting stories of medical practice in those early days, when the local practitioner was not exempt from the attentions of bushrangers and escaped convicts.

With the passing of the convict era medical matters in the settlement underwent a great change, and in 1848 the hospital was converted to the public use and became a charitable institution. This change was largely due to the efforts of Dr. Matthew Anderson and Dr. Patrick Hill, whose work for the good of the rapidly growing town is told in detail. In 1850 an act to incorporate and endow the University of Sydney was passed, and the first registrar and secretary was a Parramatta physician in the person of Dr. Richard Greenup.

Dr. Brown makes a further claim for two Parramatta surgeons. He states that Dr. Rutter and Dr. Gwynne administered chloroform to patients in 1850. This antedates the usually accepted first administration at Sydney Hospital by Dr. Alleyne in 1852. The early history of anaesthesia in Australia is still vague, and research is badly needed among the old contemporary papers and letters. The middle sixties were to see one of the greatest discoveries ever made in medical science—the discovery of surgical antiseptics by Lister. Once again a Parramatta surgeon was in the vanguard of medical progress. George Pringle shares with the Melbourne surgeon William Glibbe the distinction of introducing Lister's teachings into Australia. Which surgeon was first is impossible to say, because they both, in December, 1867, published accounts of cases treated with carbolic acid.

George Pringle had studied under James Syme (who, by the way was not "Sir James") and was a friend and fellow student with Lister, and seems to have carried on

1 "Medical Practice in Old Parramatta: An Historical Review of Village Doctoring in the Colony of New South Wales", by Keith Macarthur Brown: 1937. Australia: Angus and Robertson Limited. Double crown 8vo, pp. 152, with illustrations. Price: 12s. 6d. net.

experiments on the treatment of wounds which anticipated the discoveries of Lister. Lister published his epoch-making articles in *The Lancet* of March, 1867, and within a few months Gilbee and Pringle described cases in which they had used the new methods. Thus the surgeon of the day, separated from his home country by many months of sea voyaging, managed to keep himself up to date with the latest discoveries.

The fact that Pringle published his cases in *The Sydney Morning Herald* of the day led to much controversy, and he was accused of advertising, but made the defence that, there being no medical journal at that time in New South Wales, there were no other means of making new discoveries known to the medical profession.

The early seventies saw the arrival of one of the most interesting medical personalities of Parramatta. In 1873 the genial and well-beloved Irishman, Isaac Waugh, succeeded to the practice of George Pringle. For forty years Waugh served the public without thought of gain, and his son still carries on the medical tradition of the family. Dr. Waugh was the doctor who attended the Duke of Edinburgh when he was shot by a Fenian at Clontarf. Waugh at this time was a naval surgeon.

The latter half of his book is devoted by Dr. Brown to the history of the three generations of his family who have carried on the family practice in an unbroken line for eighty years. The first of the line, Walter Brown, came to Parramatta in 1857 and was a pioneer in the performance of the operation of ovariectomy, and a most interesting description of the removal of an ovarian cyst weighing fourteen pounds throws a vivid light on the surgical procedures of the time.

The story is brought down to the end of the nineteenth century, and the names of many well-known Parramatta doctors pass through the pages; but space will not permit of more quotations.

Dr. Macarthur is to be congratulated on having written a most interesting book, which is a notable contribution to the history of the medical profession in Australia. If at times he is discursive and given to wander down side-tracks, he may be forgiven, because his side-tracks, even if they break the continuity of his narrative, lead us to most interesting vistas of early colonial life. May we hope that in the near future he may give us more details of the lives and work of the medical men whom he mentions only briefly in this book. Surely men like Grattan Douglass, Matthew Anderson and Richard Greenup, to mention only three, would repay fuller study. It is to be hoped that Dr. Brown's example will be followed by other medical historians; much interesting work could be done on the early medical history of towns such as Newcastle, Windsor, Bathurst and Goulburn. The Section of Medical Literature and History of the New South Wales Branch of the British Medical Association has justified its existence if its encouragement has helped in the writing of a work of outstanding interest, such as this.

The book is well produced, is pleasing to look at, has an excellent index, and many interesting and uncommon illustrations and portraits. It should be owned by every medical man who has an interest in those pioneer medical men whose lives are a shining example to their modern colleagues.

PULMONARY TUBERCULOSIS.

DR. R. C. WINGFIELD has written for the general practitioner a small book entitled "Pulmonary Tuberculosis in Practice: A Modern Conception".¹ It gives in a clear and concise manner a modern view of the pathology and treatment of this disease. The subject matter is arranged in rather an unusual but none the less interesting manner. It is accompanied by symbols and charts which at first sight appear cumbersome, but which, with a little concentration on the part of the reader, can be understood and used to clarify the text.

¹ "Pulmonary Tuberculosis in Practice: A Modern Conception", by R. C. Wingfield, B.A., M.B., B.Ch., F.R.C.P.; 1937. London: Edward Arnold and Company. Demy 8vo, pp. 127, with illustrations. Price: 9s. net.

Much emphasis is rightly laid on the diagnosis of the "secondary" lesion. But why neglect the diagnosis of the primary infection? And why not do everything possible to prevent a secondary spread? This is just as rational and just as feasible as preventing the spread of infection altogether. The difficulty, of course, is to know which persons who have been infected will overcome the infection unaided and which will progress to a severe secondary lesion. It is here that constant watchfulness is essential, and Dr. Wingfield has done well to draw attention to this important aspect.

The statement that the Mantoux test is seldom used for clinical purposes is difficult to understand. It is the basis of every modern survey in the campaign against tuberculosis, and at times is indispensable in the differential diagnosis of such lung conditions as bronchiectasis, bronchopneumonia, hydatid cysts, malignant disease, syphilis or mycotic disease. To be able to exclude tuberculosis in any of these conditions is most helpful.

The advice to leave a pleural effusion severely alone surely calls for comment. Dr. Wingfield would "replace" an effusion only if there was evidence of lung involvement. But what evidence of lung involvement can be demonstrated when the pleura is filled with fluid, unless perchance the patient is coughing sputum? The only safe procedure is to "replace" every effusion of tuberculous origin.

Notes on Books, Current Journals and New Appliances.

A HAND-BOOK OF TREATMENT.

PRESUMABLY hand-books of treatment are published because there is a sale for them. In principle we do not approve of them, but we can imagine occasions on which they will be useful; in other words, they may occasionally be useful as books of reference. The danger lies in making such a book of reference a book for study. Dr. Edward A. Mullen's "Hand-Book of Treatment" will be found useful by those who like to use books of this kind.¹ The main part of the book consists of what is called "Treatment and Formulary". Conditions are considered in alphabetical order, and treatment is described. Perhaps one of the most useful parts of the book is found at the end, in diet lists for various conditions. The book is well printed, and the paper and binding are all that can be desired; we think that the price is too high.

ABNORMALITIES IN MEDICINE.

DR. G. M. GOULD AND DR. W. L. PYLE were at great pains to collect into one volume records of anomalies and curiosities which had been reported in medical literature "from its origin to the present day" (1896). The book, which has been reprinted, is a curious collection and consists of eighteen chapters, in which are recorded every possible abnormality of structure and function of the human body.² It is a kind of chamber of horrors to which many people will be attracted; it could also be described as a "believe it or not" book. Although the volume is large, the paper is of a poor quality and the illustrations are not well reproduced. The price is outrageous.

¹ "Hand-Book of Treatment", by E. A. Mullen, M.D., F.A.C.S., with a foreword by H. C. Wood, Junior; 1937. Philadelphia: F. A. Davis Company; Australia: Angus and Robertson Limited. Demy 8vo, pp. 707. Price: 30s. net.

² "Anomalies and Curiosities of Medicine", by G. M. Gould, A.M., M.D., and W. L. Pyle, A.M., M.D.; 1937. New York: Sydenham, Publishers; Australia: Angus and Robertson Limited. Royal 8vo, pp. 986, with 295 illustrations in the text. Price: 30s. net.

The Medical Journal of Australia

SATURDAY, APRIL 23, 1938.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE TREATMENT OF GONOCOCCAL INFECTIONS.

THE present-day treatment of gonorrhœal infections by irrigation cannot be regarded as particularly satisfactory. Doubtless many cures are effected, but much time is taken up and both the endurance of the sufferer and the patience of the doctor are often put to a severe test. For many years medical practitioners have been looking for a drug which would be effective and which would at the same time do away with the need for copious irrigations; it was therefore not unnatural that when the therapeutic action of sulphanilamide was reported in 1935, the drug should be tried in the treatment of gonorrhœa as well as of other bacterial infections. Several reports of its effect on the gonococcus have been issued, and the latest comes from the United States Public Health Service in its pamphlet "Venereal Disease Information" for December, 1937.

The authors of this report are C. J. Van Slyke, J. D. Thayer and J. F. Mahony. They record the results obtained by some other workers. Renter reported the clinical recovery of 90 in a series of 100 patients treated with sulphanilamide. Buchtel

and Cook, obtaining favourable results in 27 of 31 patients treated with sulphanilamide, concluded that the drug was a potent urinary antiseptic. Herrold stated that it would be safe to predict that more than two-thirds of chronic infections could be cured in from two to four weeks on moderate dosage, and that in new infections the best results would probably be obtained in patients who had previously had gonorrhœa. Herrold also thought that it seemed doubtful whether more than one-third of well-developed acute infections would be cured, even with maximum dosage, in a period of from one to three weeks. Miller, basing his statements on only eight cases, stated that sulphanilamide would not cure antero-posterior urethritis with prostatitis, and was of real value only in the acute stage of gonorrhœa. Taken in conjunction with these reports from the literature, the findings of Van Slyke, Thayer and Mahony in their series of 100 cases are of such interest that they should be given in some detail. Infections of less than twenty-eight days' duration were classed as acute, and those of longer duration as chronic. There were thus 64 acute and 36 chronic infections. In five of the acute cases there was evidence of posterior involvement, and 30 of the chronic cases had evidence of varying degrees of posterior urethritis and prostatitis; epididymitis was present in 12 of the chronic cases. The patients were admitted to hospital and their daily fluid intake was restricted to 1,500 cubic centimetres. The drug was administered at intervals of four hours. When a favourable response was obtained, a moderately sized urethral sound was passed into the bladder and the pendulous part of the urethra was massaged over the sound. If no recurrence of discharge followed, the manœuvre was repeated on the second day following. After the second passage of sounds the combined urethral-prostatic secretion was examined by smear and culture methods. If no gonococci were discovered, the entire procedure was repeated after an interval of two days. If this routine treatment failed to disclose a residual infection, the patient was discharged from hospital and was told to return for reexamination at frequent intervals. Thirty-nine patients received 5.18 grammes of sulphanilamide

per day; among these there were 30 apparent cures and nine failures; in this group there were 25 acute cases with eight failures, and 14 chronic cases with one failure. Fifty-nine patients received an initial dosage of 7.77 grammes of the drug; of those with acute infections, 31 were apparently cured and seven cases were branded as failures; 21 patients with chronic infections were cured. It is most important to note that all the patients except nine displayed some evidence of toxic effect of the drug; the toxic effect tended to clear as soon as treatment was stopped; no severe hæmolytic anæmia was encountered.

In discussing their results, these authors state that they can find no ready explanation for the failures in the series. They think that an immune mechanism may be necessary for the efficient action of the drug; but they add that the failures will probably not be explained until the mode of action of the drug is better understood. Although Van Slyke, Thayer and Mahony hold that the minor toxic manifestations noted by them do not warrant cessation of treatment, medical practitioners would do well to remember the reports of serious sequelæ that have been published. Obviously, if this treatment is to be used, the patient must be under constant observation, and it would appear that treatment should be short and intensive. Before long, doubtless, means will be found of avoiding the toxic manifestations—the drug may be modified or a new but closely related drug may be found to take its place.

Current Comment.

THE METHOD OF ACTION OF SULPHANILAMIDE.

A VAST amount of research has been conducted and an immense literature has accumulated concerning sulphanilamide. But even yet we do not know the mechanism of its action. It may have a parasitotropic affinity for streptococci and other organisms, or it may act, as does arsenobenzol, through the reticulo-endothelial system. E. E. Osgood, with the technical assistance of Inez E. Brownlee, has made extensive studies of the human marrow in an endeavour to elucidate the problem.¹

He points out that the simple method of culture of human marrow is well adapted for estimating the value of therapeutic agents. It allows determination of their effects on living human cells, of the toxic dose and of the minimum effective therapeutic dose, and accurate control of concentration. Sulphanilamide was chosen as an object of study, as the suggestion had been made that its action might be directly on the blood cells and not on bacteria alone. In this particular study all the experiments were with the β -hæmolytic streptococcus. All aspects of the problem were minutely considered. The study included the effect of sulphanilamide on living human marrow cells, the effect of varying the concentration of the drug on the course of infection with these streptococci, the effect of varying the number of streptococci inoculated, and also the effect of varying the composition of the medium. Osgood asks a series of questions. Can the failure of sulphanilamide to destroy the streptococci in every instance be explained by the development of a resistant strain? Is the late appearance of organisms due to destruction of the sulphanilamide? Are the results explained by the formation of another compound from sulphanilamide? Does sulphanilamide itself destroy streptococci, or does it destroy the toxin of the streptococci? Has it a permanent effect on the toxin-producing power of the organism? Does it affect phagocytosis?

Osgood considers that his experiments seem to indicate that the major action of sulphanilamide on infections with these streptococci is to neutralize or to destroy the toxins and to cause a diminished rate of division. It does not kill the streptococcus, but, by neutralizing the toxins and diminishing the rate of multiplication of the organisms, it enables the bactericidal action of human serum and the phagocytic action of the neutrophile cells and monocytes of the marrow and blood to overcome the infection. Osgood asserts that sulphanilamide in a concentration of 1 in 100,000, which is conspicuously less than the 1 in 10,000 now used clinically, is effective. It is admitted, however, that this observation requires confirmation by carefully controlled experiments on large numbers of human infections before it is justifiable to give smaller doses to patients who are dangerously ill. Osgood, referring to the investigations of others, states that a number of the results obtained have been very difficult to explain on the basis of any suggestion previously advanced as to the mode of action of sulphanilamide preparations. Osgood critically refers to these investigations in detail. One type of observation that is difficult to explain is the effectiveness of a number of compounds that are not in themselves bacteriostatic, but which break down in the body to yield sulphanilamide. The difficulty is that in the doses used the amount of sulphanilamide formed would give a concentration in the blood far less than the 1 in 10,000 that has been deemed necessary for the effectiveness of sulphanilamide. But A. T. Fuller has shown that the blood of patients under

¹ *The Journal of the American Medical Association*, January 29, 1938.

successful treatment with "Prontosil" may contain only one part in 100,000. Some observers, however, have asserted that the sulphanilamide derived from some of these complex compounds will not explain their therapeutic activity. Osgood is emphatic that the rapid alteration in the clinical course of streptococcal meningitis, erysipelas and scarlet fever can more readily be explained on the basis of neutralization of toxin than on the basis of bactericidal action. In other words, the effect of sulphanilamide in such infections is somewhat analogous to the action of antitoxin in diphtheria.

Osgood says that if his conclusions are correct (and his series of carefully controlled studies indicates that they hold good in regard to conditions in the human body as well as in living human marrow cultures) certain factors should govern this type of therapy. These factors he details. He affirms that decrease in dosage would in all probability greatly diminish the incidence of toxic effects. Therapy should be initiated as soon as possible, as effectiveness is enhanced if the number of organisms is not excessive. Small doses at frequent intervals to maintain a concentration of the drug in the body fluids greater than 1 in 100,000 at all times should be more effective than larger doses at longer intervals. There is no object in giving the drug intravenously when oral medication is possible, except for the first dose, to patients who are very ill. Therapy should be maintained until attempts at cultures fail. After discontinuance of treatment the patient must continue under close observation, and administration of the drug must be resumed on the slightest indication of recrudescence of the infection. There is no object in using any compound other than sulphanilamide itself, as probably it has to be converted to sulphanilamide before action can occur; this involves needless delay and renders control of the concentration difficult. These experiments also suggest that sulphanilamide should be of value in all infections due to hæmolytic streptococci, and in such conditions as scarlet fever or glomerulonephritis, in which symptoms are due to toxins alone. As the action of the drug is somewhat analogous to that of an antitoxin, its effectiveness in small repeated doses should be determined as a prophylactic in such infections as septic sore throat. Osgood's investigations seem to demonstrate that sulphanilamide has no effect on infections with the *α*-hæmolytic streptococcus (*Streptococcus viridans*) or the hæmolytic staphylococcus in marrow cultures, but that it does seem to have, in concentrations of 1 in 10,000, a sufficiently favourable influence on the course of pneumococcal infections, other than those of Type III, to justify controlled clinical investigation of the drug as a supplement to serum in the treatment of pneumonia. Osgood and others have shown that sulphanilamide does not neutralize diphtheria toxin or tetanus neurotoxin in guinea-pigs, but appears to inactivate a certain fraction of freshly prepared perfringens hæmotoxin *in vitro*. Osgood affirms that sulphanilamide has no direct action on phagocytosis, but permits the bactericidal

properties of human serum to kill organisms which otherwise they would be unable to kill. His is a noteworthy contribution.

FEVER THERAPY IN ARTHRITIS.

THE literature of fever in the treatment not only of various parasymphilitic lesions, but of gonorrhœa and chronic arthritis, is already so vast that the time has come for the production of an authoritative text-book upon the subject. There can be no doubt that many patients who are now given this kind of treatment, especially those who suffer from one or other of the various forms of arthritis, cannot be regarded as suitable subjects to be exposed to the dangers of high pyrexia.

E. E. Simmons,¹ of the University of Nebraska, has uttered the necessary warning that in all cases a careful history should be taken, complete physical examination should be made, and radiological examination of the accessory sinuses and of affected joints, together with blood counts, urinalysis and a Wassermann test, should always be performed in order to make accurate estimates of the subject's condition. It is safe to say that a patient who has to face the ordeal of submitting to a high fever, often of 41.1° C. (106° F.) or more, for the treatment of a gonorrhœal arthritis, must be one who could undergo a major surgical operation without peril.

It should be an easy matter in all major Australian hospitals to establish arthritis committees, composed of orthopaedic surgeons, experts in X rays, and pathologists, to study all cases of arthritis, not only to assess the value of fever therapy, but to make use of all useful forms of therapy in the various types of arthritis.

Simmons, like other workers, thinks that hyperpyretic treatment in acute rheumatic fever with active endocarditis is a distinct improvement over any other type of treatment now in use. Of nine of his cases, six became inactive in an average of twenty-four days following the induction of fever on an average of five occasions. Of twenty-three patients with gonorrhœal arthritis, 82% were either cured or much improved after an average of 26.4 hours of fever treatment at temperatures between 41.1° and 41.7° C. (106° and 107° F.). Here again the fever treatment is the best so far employed. But there is general agreement that it must be used at an early stage, and is best combined with orthopaedic measures. The same may be said in a general way of the treatment of chronic arthritis, whether of the atrophic or hypertrophic variety.

Like many other forms of treatment, fever therapy is now exploited by charlatans. It cannot be too strongly insisted that this treatment should be given only by physicians who have received adequate training, and that in the vast majority of instances it is not suitable for employment in the doctor's consulting rooms.

¹ The American Journal of the Medical Sciences, August, 1937.

Abstracts from Current Medical Literature.

MEDICINE.

Influenza.

T. STOKES, JUNIOR, A. C. MCGUINNESS, P. H. LANGRISH AND D. R. SHAW (*American Journal of the Medical Sciences*, December, 1937) report the results of intramuscular vaccination of human beings with active virus of human influenza. The inmates of certain State colonies were given three injections of two cubic centimetres each of culture at intervals of one week. As a rule only mild local reactions occurred, and the injections did not appear to cause any respiratory symptoms. Of the inmates of each colony, only one-third received injections, the remainder being used as controls. It appeared that the vaccinated subjects suffered from influenza less often and in less severe forms than the unvaccinated; but no definite conclusions as to the duration of the partial immunity thus conferred could be drawn.

Exophthalmos.

L. A. SCHALL (*The Journal of the American Medical Association*, November 6, 1937) discusses exophthalmos complicating irradiation. He reports five cases in which exophthalmos developed as a result of irradiation treatment of malignant disease of the nasal sinuses. Three of these patients had been treated by operation prior to irradiation. In some cases exophthalmos developed within twenty-four hours; in others several weeks elapsed before it was noted. Orbital pain was constant. If corneal ulceration or infection, loss of vision or limitation of ocular movements occurred, enucleation of the eye was necessary. The pathological process was essentially one of degeneration and vessel thrombosis. Operative measures to protect the eye appeared to be of little value.

The Effect of Sympathectomy in Raynaud's Phenomenon.

E. D. TELFORD (*The Lancet*, January 8, 1938) discusses sympathetic denervation of the upper extremity. The results of cervico-thoracic ganglionectomy in cases of Raynaud's phenomenon have been unsatisfactory, though lumbar cord ganglionectomy has resulted in complete and permanent cure in such cases. The reason for this difference, in the author's opinion, lies in the fact that the cervical operation is usually performed on the post-ganglionic fibres, whereas the lumbar operation is performed on the pre-ganglionic fibres. He describes an operation that he has performed on twenty-five patients since February, 1935. It consists of division of the

thoracic ganglionated cord below the third thoracic ganglion, with division of the rami that enter the cord from the second and third thoracic nerves. The cervico-thoracic ganglion and the white ramus from the first thoracic nerve are left intact. This operation has been performed for severe chilblains, for acrocyanosis and for typical Raynaud's disease of the hands. Good results have been obtained and have persisted for as long as two and a half years in some cases; in others relapse has occurred after three to five months. The author believes that in these latter cases regeneration of the sympathetic nerves has occurred. He has therefore modified the procedure described above by ligating the cut ends and securing the upper ends to the *scalenus anterior* muscle. Since doing so he has had no instances of relapse.

Vitamin A Deficiency.

H. JEGHERS (*The Journal of the American Medical Association*, September 4, 1937) discusses the degree and prevalence of vitamin A deficiency in adults. One hundred and sixty-two students were tested by the biophotometer and their dark adaptation was noted. Fifty students showed subnormal dark adaptation, and of these, 27 were conscious of this. This consciousness constitutes night blindness. Fifteen of these subnormal students had dry skins. Investigation of their diets revealed the fact that the subnormal group had lived on diets poor in vitamin A for some weeks or months. The foods which contain vitamin A in appreciable quantity are many. Those who showed vitamin A deficiency had lived on diets containing little or no dairy produce, and no liver, fruit or vegetables such as carrots (raw), squash, tomatoes or spinach, which have a high content of carotene. Capsules of carotene in oil or halibut liver oil were given, 70,000 units of vitamin A being given orally each day for two weeks, followed by 25,000 units daily until dark adaptation was normal. Another symptom of which some of the students in the abnormal group complained, was photophobia; this symptom was relieved along with night blindness in the majority of patients in from one to twenty weeks. The minimal daily requirement of vitamin A is about 4,000 units per day for an adult. Those who suffered from night blindness usually suffered from minor infections to a greater extent than was normal. In this series of cases, colds, sore throats, dental abscesses, furunculosis and other infections were noted in those whose diet was deficient in vitamin A. Jeghers records that he himself, after living on a diet deficient in vitamin A for five weeks, suffered from mild photophobia and definite night blindness. Night blindness due to vitamin A deficiency interfered with the driving of automobiles at night, and was the apparent cause of accidents incurred

by five of twenty-one patients referred to in this article. These patients were easily dazzled and temporarily blinded by headlights from other automobiles, especially on dark country roads. Long drives at night were unduly fatiguing, and after passing another car the patients found that they could not see the road nor objects upon it clearly. These individuals were treated with vitamin A, and several of them became capable of normal driving at night.

Bronchomonilliasis.

ROBERT S. FLINN AND JOHN W. FLINN (*The Journal of Tropical Medicine and Hygiene*, October, 1937) state that bronchomonilliasis is a widespread disease and occurs more frequently than is generally supposed. It was formerly believed to be limited to the tropics, but many cases occur in temperate areas. The first cases were reported by Castellani from Ceylon, where persons suffering from a disease resembling pulmonary tuberculosis were shown to be infected with pathogenic monilia. This was present in the dust of tea leaves, and infection was by inhalation. It has been held that a preexisting irritative factor enables the fungi to gain a foothold in the respiratory tract, and there is frequently a history of previous respiratory infection. All forms of respiratory disease are seen, from those closely resembling pulmonary tuberculosis and acute lobar pneumonia to more mild and chronic forms, tracheobronchitis, bronchitis and asthma. In the milder forms toxic symptoms are lacking. The patient complains of a mild cough and a slight amount of expectoration. Physical signs in the chest are usually lacking, and such patients frequently recover spontaneously after some weeks, though some develop a more serious form of this infection. The intermediate type consists of patients with chronic bronchitis of moderate severity, with cough and expectoration. The cough is paroxysmal, and dyspnoea is frequently present. The sputum is mucoid and frequently blood-stained; slight fever, moderate loss of weight and toxic symptoms are present. The physical signs are those of a moderately severe chronic bronchitis. In the severe forms a marked similarity to pulmonary tuberculosis is frequently observed. The onset is insidious, with alternate periods of progress and retrogression, cough, expectoration, chest pain, hæmoptysis and loss of weight and strength. These symptoms are accompanied by signs of pleural thickening, infiltration, consolidation and even cavity formation. In some cases the skiagram presents difficulty in differentiation, for although monilia commonly attack the base and mid-portions of the lungs, leaving the apices relatively clear, a hazy infiltration not unlike that seen in tuberculosis may extend well into the apices. The diagnosis is made largely

by exclusion. Repeated sputum examinations, including animal inoculation, exclude tuberculosis. Fresh sputum collected after a mouth-wash shows yeast cells of the monilia type, with characteristic growth on cultivation. Tuberculosis and moniliasis have frequently been found in the same patient, and either may have been the primary process. The author quotes Marett, who states that in Jersey moniliasis is as common as tuberculosis, and advises that in cases in which they are coexistent the moniliasis should be treated first. Early diagnosis is important, as excellent results are obtained in the mild and intermediate stages by the use of iodides, the lesions clearing rapidly. Iodides may be given as potassium iodide in doses of 10 to 30 grains, three or four times daily; as sodium iodide 30 to 60 grains, intravenously, daily; or by inhalation of ethyl iodide. Intratracheal injection of iodized oil has been used with benefit, and vaccines are indicated if a rapid response does not follow iodide therapy. Laboratory workers should be instructed to search for yeast cells and to report on their occurrence in the sputum.

The Sternal Bone Marrow.

W. DAMESHEK *et alii* (*Annals of Internal Medicine*, November, 1937) accept the importance of sternal bone marrow biopsy in the differential diagnosis of cases of obscure and chronic anemia refractory to treatment by liver and iron, and usually associated with leucopenia and thrombocytopenia. The comparative values of the trephine method of obtaining the specimen and of the more recent puncture method are discussed in the present paper. In the first procedure a small plug of bone is removed from the *manubrium sterni* at the level of the fourth intercostal space, and from it two types of preparations are made: first, sections in which the cellularity of the marrow, the topographical relations of various groups of cells and the presence or absence of islands of embryonic cells may be observed; and secondly, smears in which careful study of individual cells can be made. In order to make a complete study of the bone marrow, both sections and smears are essential. The puncture method consists in the introduction into the sternal cavity of a modified lumbar puncture needle, through which material for smears is obtained by suction with a syringe. Comparison of the findings by both methods in a series of twenty consecutive cases is made. The smears from the trephine method showed a far greater cellularity than the smears made by puncture, and also a greater reticulocyte percentage, a greater number of erythroblastic cells relative to granulocytes, and a greater number of early nucleated red cells. The puncture preparations frequently consisted almost entirely of red blood cells, interspersed among which were some marrow cells. The material

obtained by puncture is better termed "marrow juice", for it is not really marrow. Lack of cellularity in this aspirated material does not necessarily mean lack of cellularity in the marrow itself; primitive erythroblastic cells, present in the marrow, are frequently not obtained; abnormal islands of neoplastic and leukaemic cells are either not obtained or, if seen, may be misinterpreted because of lack of topographical relationship. The chief advantage of puncture biopsy is its simplicity, but this is greatly outweighed by its inaccuracy.

Treatment of Malaria with Immune Blood.

N. LORANDO AND D. SOTERIADES (*Transactions of the Royal Society of Tropical Medicine and Hygiene*, July, 1937) describe the treatment of malaria by the injection of immune whole blood of persons living in the same area. Although many believe that immunity to malaria does not exist, the possibility of increased resistance to the disease has been shown. In 1935 the authors reported twenty-three cases of malaria in which cure was effected by this method, and they here report a further twenty cases. The procedure employed was to inject whole immune blood in doses of from 10 to 20 cubic centimetres subcutaneously three or four times at intervals of a few days. The treated patients fall into two groups, those treated with immune blood and quinine, and those treated with immune blood alone. The first group of eleven cases is representative of a great number of children who suffer from continual attacks of malaria. They can be temporarily cured by quinine, "Atebrin" or "Plasmoquine", but attacks return each year until the child reaches the age of fifteen years or more. In some cases quinine was added to the immune blood treatment for several days. In practically all cases the temperature dropped rapidly after the injection of blood, and the spleen diminished in size in the next few days. Failure was met with in only two cases, in which it was believed that the injected blood was not immune. The treatment of nine persons who had not received quinine or "Atebrin" resulted in clinical cure. It was not possible to expose the treated patients to reinfection by artificially infected mosquitoes, though many were naturally exposed in places where escape from infection was impossible, with maintenance of the cure. The authors believe that the method merits further experiment.

Quinine and "Atebrin" in Malaria.

J. G. OVERBEEK AND A. W. P. GILBERT (*Mededeelingen van den dienst der Volksgezondheid in Nederlandsch-indie*, Volume XXVI, Number 4, 1937) compare the action of quinine and "Atebrin" in the treatment of benign tertian malaria in a series of 100 persons during an epidemic outbreak. Fifty-three patients were treated with

"Atebrin" (300 milligrammes daily for four days) and 47 with quinine sulphate (six tablets of 222 milligrammes daily for seven days). The action of quinine on the parasites was found to be slower than that of "Atebrin". Three weeks after treatment 34% of patients in the quinine group and only 5.6% of those treated with "Atebrin" showed parasites in the blood. This effect was probably due to the slower excretion of "Atebrin". One case of acute mental disorder occurred immediately at the conclusion of a four-day course of "Atebrin", when the patient showed no fever and no circulating parasites. The mental symptoms disappeared in fourteen days. A month later the same person suffered from a further malarial attack, with high fever and parasites in the blood. After a single dose of "Atebrin" (300 milligrammes) he again became anxious and confused. The course of "Atebrin" was completed, though after five days he still showed fever and circulating parasites. Following the administration of one gramme of quinine the temperature became normal and the patient more quiet. The authors, while uncertain that "Atebrin" was the cause of the mental symptoms, point out that these closely followed its administration in both attacks.

Tuberculous Cervical Lymphadenitis.

CLAUDE FRANKAU (*Proceedings of the Royal Society of Medicine*, December, 1937) considers that in the medical treatment of tuberculous glands of the neck, hygienic surroundings, cod liver oil and malt, and the syrup of iodide of iron still hold pride of place. Violent exercise is forbidden. He has no good word for tuberculin; its only effect, in his experience, is a rapid breaking-down of the affected glands. The protagonists of aspiration at one time advised tuberculin for this very purpose, which is of doubtful advantage. Aspiration should be reserved for those cases in which the skin is reddened. Irradiation can help in minor and diffuse enlargements, but cannot have any effect on glands which are full of caseous deposits. Tonsillectomy may be followed by a flare-up of the affected glands.

Malignant Diphtheria.

P. BAMBERGER AND W. ZELL (*Zeitschrift für Kinderheilkrankheiten*, Volume LVIII, 1936, quoted in *The Lancet*, January 15, 1938) report that better results in children suffering from malignant diphtheria have been obtained by the giving of vitamin C and suprarenal cortical extract in addition to antitoxin than by the use of antitoxin alone. *In vitro* vitamin C inactivates diphtheria toxin. In guinea-pigs the action of diphtheria toxin can be "overcome" by the administration of suprarenal cortex and ascorbic acid together, whereas either alone is ineffective.

British Medical Association News.

ANNUAL MEETING.

The annual meeting of the New South Wales Branch of the British Medical Association was held at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, on March 24, 1938, Dr. L. A. Dey, the President, in the chair.

ANNUAL REPORT OF COUNCIL.

On the motion of Dr. E. H. M. Stephen, seconded by Dr. G. M. Barron, the annual report was received. The report is as follows.

The Council presents the following report on the work of the Branch for the year ended March 24, 1938.

Membership.

The membership of the Branch is now 1,741, as against 1,679 at the date of the last report. The additions have included 98 elections, re-elections and resumptions, and 38 removals into the area of the Branch; while the losses have included 1 by resignation, 33 removals out of the area of the Branch, 22 by default in payment of subscription, and 18 by death. The losses by death were as follows: Dr. A. J. Spiller Brandon, Dr. P. G. Crago, Dr. D. Murray Ross, Dr. A. N. Yuille, Dr. A. J. C. Crawley, Dr. R. C. Lane, Dr. J. B. Moore, Dr. R. H. Schlink, Dr. G. A. Paton, Dr. A. W. Campbell, Dr. L. Fetherston, Dr. W. A. Ramsay Sharp, Dr. James Hunter, Dr. H. H. Bullmore, Dr. Andrew Davidson, Dr. P. Sydney Jones, Dr. W. L. Magill, Dr. A. J. Dunn.

Meetings.

Nine ordinary meetings of the Branch (including the annual general meeting), two extraordinary meetings and eight clinical meetings were held. The average attendance was 55. Eight of the ordinary meetings were held in conjunction with meetings of sections, namely: April 29, with the Section of Orthopaedics and the Section of Paediatrics; May 27, with the Section of Surgery and the Section of Orthopaedics; June 24, with the Section of Medicine and the Section of Pathology and Bacteriology; July 29, with the Section of Neurology and Psychiatry and the Section of Medicine; September 30, with the Section of Pathology and Bacteriology and the Section of Medicine; October 28, with the Section of Paediatrics and the Section of Obstetrics and Gynaecology; November 25, with the Section of Paediatrics and the Section of Radiology; December 9, with the Section of Orthopaedics and the Section of Paediatrics. The clinical meetings were held at the Royal Alexandra Hospital for Children, the Royal Prince Alfred Hospital, the Royal North Shore Hospital, the Royal Hospital for Women, the Prince Henry Hospital, Saint Vincent's Hospital, Sydney Hospital and the Broughton Hall Psychiatric Clinic. The business of the meetings included fourteen papers and addresses, numerous reports of cases, exhibits and demonstrations, and the showing of films. The extraordinary meeting on June 24 was convened for the purpose of discussing the proposal to constitute a new by-law governing an ethical matter. By resolution this matter was referred to the local associations for an expression of opinion. The extraordinary meeting on December 9 was then convened for the purpose of constituting this by-law (By-law 19 (A)) and also to constitute a new by-law governing workers' compensation insurance practice (By-law 25 (A)). An invitation was extended to the fifth and sixth year medical students of the University of Sydney to attend the ordinary and clinical meetings of the Branch.

Representatives.

The Branch was represented as follows:

- (a) Council of the British Medical Association (1938-1941): Professor R. J. A. Berry.

- (b) Representative Body of the British Medical Association (1937-1938): Dr. A. J. Collins, D.S.O., M.C. Deputy Representative: Sir Charles Blackburn, O.B.E.
- (c) 105th annual meeting, British Medical Association, Belfast, 1937. Delegates: Dr. A. W. Holmes & Co., Sir Charles Blackburn, O.B.E.
- (d) Federal Council of the British Medical Association in Australia: 1937—Dr. George Bell, O.B.E., Dr. A. J. Collins, D.S.O., M.C. 1938—Dr. George Bell, O.B.E., Dr. W. F. Simmons.
- (e) Australasian Medical Publishing Company, Ltd.: Dr. T. W. Lipscomb, Dr. F. P. Sandes, Dr. A. M. Davidson, O.B.E.
- (f) New South Wales Post-Graduate Committee in Medicine: Professor W. K. Inglis, Dr. L. W. Dunlop.
- (g) Institutional Supplies Committee, Standards Association of Australia: Dr. S. W. G. Ratcliff.
- (h) Ophthalmic Association Limited: Dr. R. B. North.
- (i) Eighth Australian Cancer Conference, April 13 to 16, 1937: Dr. F. P. Sandes.
- (j) Australian Aerial Medical Services: Dr. George Bell, O.B.E. Deputy Representative: Dr. J. G. Hunter.
- (k) Recreation and Leadership Movement: Professor Harvey Sutton.
- (l) Public School Teachers' Federation Conference: Dr. E. H. M. Stephen, Dr. W. Vickers.
- (m) Metropolitan Hospitals Contribution Fund of New South Wales: Dr. R. V. Graham.
- (n) St. John Ambulance Association: Dr. L. A. Dey.
- (o) Executive Committee of the Council for Mental Hygiene for New South Wales: Dr. C. K. Parkinson.
- (p) Board of Control of the Campaign Against Tuberculosis: Dr. A. S. Walker.
- (q) Council of the Royal Society for the Welfare of Mothers and Babies: Dr. R. B. Wade, Dr. E. H. M. Stephen.
- (r) Council of the Bush Nursing Association (1937-1938): Dr. L. A. Dey.
- (s) Council of Education: Dr. A. J. Collins.
- (t) Provisional Council for the Institute of Almoners: Dr. W. Vickers.
- (u) Medical Officers' Relief Fund (Federal); Local Committee of Management for New South Wales: Dr. E. H. M. Stephen, Dr. A. M. Davidson, Dr. A. J. Collins.

Council.

- (a) The attendance of members of the Council and of the standing committees was as set out in the accompanying table.

- (b) The representatives of the Local Associations of Members, appointed on the invitation of the Council to attend the regular quarterly meetings of the Council, were as follows: Dr. C. G. Bayliss (Canterbury-Bankstown), Dr. C. R. Cole (Central Western), Dr. A. M. Gledden (City), Dr. B. W. Stevenson (Eastern Suburbs), Dr. L. W. Wing (Far South Coast and Tablelands), Dr. P. L. Charlton (Illawarra Suburbs), Dr. L. Cowlshaw (Kuring-gal District), Dr. W. F. L. Liggins (Northern District), the late Dr. L. Fetherston (South Eastern), Dr. C. H. Jaede (South Sydney), Dr. E. L. Newman (Warringah District), the late Dr. J. B. Moore (Western), Dr. M. L. Coutts (Western Suburbs).

Library.

Dr. G. C. Willcocks was again appointed to the position of Honorary Librarian.

Donations of books and periodicals were received from the Australasian Medical Publishing Company, Limited, Dr. G. H. S. Lightoller, Dr. A. G. S. Cooper, Dr. A. Lyle Buchanan, Dr. E. T. Thring, Dr. J. C. Storey, Dr. H. C. R. Darling, Dr. E. P. Blashki, Dr. R. H. Bridge, Dr. Hilton C. G. Smith, Dr. R. C. Winn, Dr. R. J. Silverton, Dr. M. S. S. Earlam, the late Dr. A. W. Campbell, Miss L. A. Philpotts (a granddaughter of the late Dr. James White), the Section of Orthopaedics, the Section of Neurology and Psychiatry, the Section of Surgery, the Section of Pathology and

Bacteriology, the Section of Obstetrics and Gynaecology, and the Section of Medicine.

The following additional publications have been purchased: *The Journal of Pathology and Bacteriology*, *The American Journal of Obstetrics and Gynecology*, *The Journal of Physiology*, *Archives of Pediatrics*, *Endocrinology*, *The Journal of Industrial Hygiene and Toxicology*, *The American Journal of Surgery*, *The American Heart Journal*, and many recent text-books.

Affiliated Local Associations of Members.

Balmain District (affiliated 1913).

Border (affiliated 1908): *Honorary Secretary*, Dr. R. A. Robertson.

Canterbury-Bankstown (affiliated 1930): *Chairman*, Dr. J. H. D. Edwards; *Honorary Secretary*, Dr. G. Russell. Membership, 24. Four meetings were held.

Central Northern (affiliated 1910): *Honorary Secretary*, Dr. A. C. Arnold.

Central Southern (affiliated 1909): *Chairman*, Dr. R. O. Williams; *Honorary Secretary*, Dr. R. G. Woods.

Central Western (affiliated 1910): *Chairman*, Dr. C. R. Cole; *Honorary Secretary*, Dr. K. S. M. Brown. Membership, 51. Two meetings were held.

City (affiliated 1913): *Chairman*, Dr. H. A. Ridler; *Honorary Secretary*, Dr. L. R. Flynn. Membership, 17. One meeting was held.

Eastern Suburbs (affiliated 1911): *Chairman*, Dr. F. Smidlin; *Honorary Secretary*, Dr. C. M. Burns. Membership, 93. Four meetings were held.

Far South Coast and Tablelands (affiliated 1935): *Chairman*, Dr. J. S. McKee; *Honorary Secretary*, Dr. K. S. Jones. Membership, 12. Two meetings were held.

Hawarra Suburbs (affiliated 1913): *Chairman*, Dr. J. S. Crakanthorp; *Honorary Secretary*, Dr. P. L. Charlton. Membership, 44. Five meetings were held.

Kuring-gai District (affiliated 1929): *Chairman*, Dr. B. G. Wade; *Honorary Secretary*, Dr. A. M. Aspinall. Membership, 63. Four meetings were held.

North Eastern (affiliated 1913): *Chairman*, Dr. F. N. Lynch; *Honorary Secretary*, Dr. J. R. Ryan. Membership, 43. Five meetings were held.

Northern District (affiliated 1911): *Chairman*, Dr. H. G. D. Cookson; *Honorary Secretary*, Dr. R. J. Jackson. Membership, 73. Two meetings were held.

South Eastern (affiliated 1914): *Chairman*, Dr. H. H. Lee; *Honorary Secretary*, the late Dr. L. Fetherston. Membership, 18.

South Sydney (affiliated 1909): *Chairman*, Dr. W. C. Darragh; *Honorary Secretary*, Dr. C. H. Jaede. Membership, 24. Four meetings were held.

Southern District (affiliated 1909): *Chairman*, Dr. H. O. Lethbridge; *Honorary Secretary*, Dr. R. E. R. Skinner. One meeting was held.

Warringah District (affiliated 1929): *Chairman*, Dr. A. S. B. Studdy; *Honorary Secretary*, Dr. E. L. Newman. Membership, 39. Four meetings were held.

Western (affiliated 1908): *Chairman*, Dr. L. W. Tunley; *Honorary Secretary*, Dr. S. R. Dawes. Membership, 68. Four meetings were held.

Western Suburbs (affiliated 1908): *Chairman*, Dr. M. L. Coutts; *Honorary Secretary*, Dr. R. F. Back; *Assistant Honorary Secretary*, Dr. H. M. Rennie. Membership, 94. Four meetings were held.

Annual Meeting of Delegates.

The twenty-fifth annual meeting of delegates of the affiliated Local Associations of Members with the Council was held on Friday, October 1, 1937. An account of the proceedings of the meeting appeared in *THE MEDICAL JOURNAL OF AUSTRALIA* of November 6, 1937, pages 850-855.

The delegates present at the meeting were as follows: *Canterbury-Bankstown*, Dr. Kevin Byrne; *Central North-*

ATTENDANCES AT COUNCIL AND STANDING COMMITTEE MEETINGS.

	Council.	Committees.				
		Executive and Finance.	Organization and Science.	Medical Politics.	Hospitals.	Ethics.
Dr. G. M. BARRON ¹	7	—	—	—	—	6
Dr. GEORGE BELL (Honorary Treasurer and Premises Attorney)	9	10	3	10	1	2
SIR CHARLES BLACKBURN ²	4	—	—	—	—	2
Dr. K. S. MACARTHUR BROWN (Acting Honorary Secretary)	9	11	—	11	—	2
Dr. A. J. COLLINS ³ (Honorary Secretary)	5	5	1	3	1	1
Dr. A. M. DAVIDSON	7	9	—	—	—	—
Dr. L. A. DEY (President)	9	12	5	10	2	6
Dr. B. T. EDYE (President Elect)	8	10	3	9	2	5
Dr. H. R. R. GRIEVE	5	5	—	7	—	—
Dr. HUGH HUNTER ⁴	2	—	1	1	—	—
PROFESSOR W. K. INGLIS	9	—	5	—	—	—
Dr. C. H. E. LAWES	6	—	—	7	1	—
Dr. A. A. PALMER	9	—	—	—	—	6
Dr. W. F. SIMMONS	9	—	—	10	2	—
Dr. E. H. M. STEPHEN (Past President)	7	10	—	—	—	6
Dr. A. C. THOMAS	9	—	3	—	2	—
Dr. E. A. TIVEY	9	—	—	9	—	4
Dr. R. C. TRAILL	9	—	—	10	2	—
Dr. W. VICKERS	8	11	—	—	1	—
Dr. A. S. WALKER	8	—	5	—	—	5
Dr. G. C. WILCOCKS (Honorary Librarian)	6	11	—	—	—	—
Meetings held	9	12	5	11	2	6

¹ Appointed by Council (Article 41), May 11, 1937.

² Leave of absence, April-October, 1937.

³ Leave of Absence, March-September, 1937.

⁴ Resigned, May 11, 1937.

ern, Dr. A. T. Roberts; *Central Southern*, Dr. R. O. Williams; *City*, Dr. A. M. Gledden; *Eastern Suburbs*, Dr. B. W. Stevenson; *Illawarra Suburbs*, Dr. G. F. L. Elliott; *Kuring-gai District*, Dr. B. G. Wade; *Northern District*, Dr. R. J. Jackson; *North Eastern*, Dr. J. Coen; *South Eastern*, the late Dr. L. Fetherston; *Warringah District*, Dr. E. L. Newman; *Western Suburbs*, Dr. M. L. Coutts.

Sections for the Study of Special Branches of Medical Knowledge.

Anæsthesia (inaugurated 1934): *Chairman*, Dr. W. I. T. Hotten; *Honorary Secretary*, Dr. H. J. Daly.
Genito-Urinary and Venereal Diseases (inaugurated 1928).

Hygiene and Preventive Medicine (inaugurated 1922).
Medical Literature and History (inaugurated 1925): *Honorary Secretary*, Dr. L. Cowlishaw.

Medicine (inaugurated 1924): *Chairman*, Dr. H. J. Ritchie; *Honorary Secretary*, Dr. K. B. Noad. Five meetings were held, including three in conjunction with meetings of the Branch.

Neurology and Psychiatry (inaugurated 1924): *Chairman*, Dr. G. P. U. Prior; *Honorary Secretary*, Dr. D. W. H. Arnott. Three meetings were held, including one in conjunction with a meeting of the Branch.

Obstetrics and Gynæcology (inaugurated 1925): *Chairman*, Dr. A. J. Gibson; *Honorary Secretary*, Dr. H. A. Ridler. Five meetings were held, including one in conjunction with a meeting of the Branch.

Orthopædics (inaugurated 1923): *Chairman*, Dr. G. Keith Smith; *Honorary Secretary*, Dr. A. R. Hamilton. Seven meetings were held, including three in conjunction with meetings of the Branch.

Oto-Rhino-Laryngology (inaugurated 1924): *Chairman*, Dr. H. S. Marsh; *Honorary Secretary*, Dr. E. P. Blashki. Three meetings were held.

Pædiatrics (inaugurated 1921): *Honorary Secretary*, Dr. L. H. Hughes. Four meetings were held in conjunction with meetings of the Branch.

Pathology and Bacteriology (inaugurated 1924): *Chairman*, Dr. O. Latham; *Honorary Secretary*, Dr. F. S. Hansman. Four meetings were held, including two in conjunction with meetings of the Branch.

Radiology (inaugurated 1926): *Chairman*, Dr. A. T. Nisbet; *Honorary Secretary*, Dr. H. M. Cutler. One meeting was held, in conjunction with a meeting of the Branch.

Surgery (inaugurated 1925): *Chairman*, Dr. J. C. Storey; *Honorary Secretary*, Dr. C. E. Winston. Two meetings were held, including one in conjunction with a meeting of the Branch.

British Medical Association Lectures.

Lectures were arranged as follows:

Central Southern Medical Association, Goulburn, April 9, 1937: Dr. F. Brown Craig, "Pelvic Injuries due to Childbirth—Prophylactic Treatment and Some Surgical Points in their Repair".

Northern District Medical Association, Tamworth, September 22, 1937: Dr. A. S. Walker, "Modern Opinion on the Dietetic and Insulin Treatment of Diabetes"; Armidale, December 8, 1937, Dr. R. A. Money, "The Treatment of Head Injuries in General Practice".

North Eastern Medical Association, Lismore, April 10, 1937: Dr. S. A. Smith, "Hypertension".

Lismore, April 1, 1937: Dr. H. R. G. Poate, "Some Considerations of the Toxic Goitre Problem".

Western Medical Association, Dubbo, September 22, 1937: Dr. R. B. Wade, "Osteomyelitis".

Federal Council.

The Federal Council of the British Medical Association in Australia met in Adelaide on August 19, 1937, and in Melbourne on February 10, 1938.

Dr. G. Bell and Dr. L. A. Dey represented the Branch at the meeting on August 19, and Dr. G. Bell and Dr. W. F. Simmons at the meeting on February 10.

Reports of the proceedings of the meetings appeared in THE MEDICAL JOURNAL OF AUSTRALIA, September 18, 1937, and March 5, 1938.

Australasian Medical Congress (British Medical Association).

(a) The Fifth Session of the Australasian Medical Congress (British Medical Association) was held in Adelaide, August 23-28, 1937, under the Presidency of Sir Henry Newland.

The great success which attended the organization and management of the meeting is a matter of hearty congratulations to all concerned. Seventy-six members of the Branch were members of the Congress.

(b) The Sixth Session of the Australasian Medical Congress will be held in Perth, Western Australia, in 1940, under the Presidency of Dr. D. D. Paton.

National Health Insurance.

Much consideration has been given to the subject of national health insurance.

The views of the Council have been conveyed by its representatives to the Federal Council who, in this important matter, is acting for, and on behalf of, the Branches of the Association in Australia.

Contract Practice.

Friendly Society Lodge.

The following proposals of the Friendly Societies Association were not approved:

1. That Clause 5 (page 2, line 3) of the Common Form of Agreement be amended to read:

"Event of any individual member accepted for the time being for medical benefits of the"

2. That Clause 17 of the Common Form of Agreement be amended by the addition at the end thereof of the following words:

"... unless satisfactory transport be provided."

3. That a specific charge of one guinea be made to a lodge patient for the setting of a fracture.

Medical Service for Unemployed Families.

An agreement was entered into between the Council and the Director of Government Relief for the provision of medical attendance for unemployed families. The terms of the agreement are practically identical with those of the Common Form of Agreement.

Other Contract Practice.

After consultation with the North Eastern Medical Association a Form of Agreement for use between members who accept appointment as medical officers to employees at the mills of the Colonial Sugar Refining Company and the Company was adopted.

Hospitals.

Gloucester House, Royal Prince Alfred Hospital.

In reply to representations that the existing rule, which precludes the attendance on patients in Gloucester House by medical practitioners other than those on the honorary medical staff of the hospital, be amended, the Board of Directors advised:

(a) That no cases, either private or intermediate, would be admitted to Gloucester House excepting under the care of a member of the Honorary Medical Staff of the Hospital;

and

(b) That facilities for consultations only on Gloucester House patients would be granted, at the patient's request, to any registered medical practitioner subject to the approval of the General Superintendent.

Resident Medical Officer Appointments.

Representations were made to the Hospitals Commission that, in the public interest, a position as a resident medical officer should be made available to every recent graduate. The Commission replied that it would make representations to public hospitals to increase their resident medical staff and, where a hospital had no resident medical officer but might advantageously employ one or more, financial assistance would be offered.

Workers' Compensation Act, 1926-1929.

Although a number of inquiries in regard to fees for attendance on injured workers has been received from members and also insurers, the arrangement between the Licensed Insurers and the Council, under which the insurers, who are parties to it, undertake to pay directly to medical attendants of "injured workers" their fees and charges, subject to these being in accordance with a Schedule, Schedule "E" appears to be working with some considerable measure of satisfaction to the members interested as well as to the insurers.

Conditions of Service of Medical Officers in the Public Medical Services.

Two Members of Council, Sir Charles Blackburn and Dr. George Bell, gave evidence before the Public Service Board on behalf of the Public Medical Officers' Association.

The Council representatives emphasized the necessity of improving the conditions in order to attract the best type of graduate to the services.

Maternal and Infantile Welfare.

The recommendations of the Committee appointed to investigate maternal and infantile welfare were adopted by the Council and will be published in THE MEDICAL JOURNAL OF AUSTRALIA at an early date.

Handbook for Qualified Medical Practitioners.

A revised (1938) edition of the "Handbook for Qualified Medical Practitioners" has just been published.

By-Laws.

In accordance with Article 68 of the Articles of Association, additions to, and amendments of, the By-laws were made as follows:

By-law 19 (A).

Honorary Medical Officer to Sporting Bodies.

No member shall act as honorary medical officer to any racing, sporting, or athletic club, or to any institution which is carried on for other than charitable purposes.

By-Law 25 (A).

Workers' Compensation Insurance Practice.

(a) A member shall not enter into any agreement for medical or surgical service with any company or firm licensed under the *Workers' Compensation Act* to carry on the business of indemnifying employers against liability to pay compensation to their workers under the Act or authorized by the *Workers' Compensation Commission* to undertake the liability to pay compensation to their workers, or with any person, persons or company representing or acting on behalf of any such company or firm unless such agreement be in such form as shall for the time being be recognized or approved by the Association: Provided that the Council may permit such modifications or variations thereof as in any particular circumstances it may deem proper.

(b) Where any agreement for medical or surgical service as hereinbefore referred to contains any provisions limiting or restricting the duty or service to be given by the member such member shall duly and faithfully observe and conform to the limitation or restriction so imposed and shall not commit any breach thereof.

British Medical Agency of New South Wales Limited.

The annual report of the British Medical Agency of New South Wales Limited was published in THE MEDICAL JOURNAL OF AUSTRALIA, October 30, 1937.

Medical Finance Limited.

Medical Finance Limited was registered under the *Companies Act* on July 21, 1937.

Briefly stated, the main object of the Company is to grant financial assistance to an approved borrower so as to enable him—

1. To acquire or establish a medical practice.
2. To provide or improve the equipment of a practice.
3. To purchase a residence or rooms to be used in connexion with his practice.

Dr. R. B. Wade, Dr. F. Brown Craig, Dr. A. M. Davidson, Dr. G. Bell, and Dr. L. A. Dey were appointed Directors of the Company.

Congratulations.

Congratulations were extended to Sir Earle Page, G.C.M.G., Sir Kaye le Fleming, Sir Norman Paul, and to Dr. J. Newman Morris, C.M.G., on the honour conferred on them by His Majesty the King.

Visitors.

Entertainment was afforded, during a short stay in Sydney, to Sir Henry Brackenbury, member of Council and late Chairman of Council, British Medical Association, who had been visiting New Zealand with the object of advising the New Zealand Branch in regard to Health Insurance.

Social.

Golf.—The Annual Competition—18 holes stroke handicap for the H. Rutherford Darling Cup—which was played on the links of the Concord Club on November 15 and the Bonnie Doon Club on November 18, 1937, and the final on the links of the Australian Golf Club, was won by Dr. F. C. Bruce Hittmann, the runner-up being Dr. Hilton C. G. Smith.

Premises Revenue Account.

The Premises Revenue Account discloses a net surplus of income over expenditure for the year ended December 31, 1937, of £2,890 8s. 11d.

A comparison of the annual percentages of expenditure to revenue from the time of opening the building in 1930 up to December 31, 1937, is as follows:

	Percentage of Expenses to Revenue.	Percentage of Result to Revenue.
½ year to December 31, 1930	119.4	Deficiency 19.4
1 year to December 31, 1931	114.8	Deficiency 14.8
1 year to December 31, 1932	109.8	Deficiency 9.8
1 year to December 31, 1933	97.9	Surplus 2.1
1 year to December 31, 1934	77.7	Surplus 22.3
1 year to December 31, 1935 (including depreciation)	102.1	Deficiency 2.1
1 year to December 31, 1936 (including depreciation)	89.0	Surplus 11.0
1 year to December 31, 1937 (including depreciation)	82.7	Surplus 17.3

The percentages of rent revenue, expenses and depreciation and the percentage of net surplus for the year to the capital value of the British Medical Association House as shown by the books at December 31, 1937, namely, £178,008 12s. 3d. with the previous years' percentages in parenthesis are as follows:

		(1936)
Rent Revenue (including amount charged for British Medical Association Branch offices <i>et cetera</i>)	9.37%	(8.16%)
Sundry Expenses, Interest, and provision for painting building	6.18%	(5.72%)
Depreciation of Building	1.57%	
	7.75%	(1.55%)
Net Surplus for year	1.62%	(0.89%)

Financial Report to Members.

The Council has pleasure in presenting to Members the Balance Sheet and Accounts in respect of the financial year, which terminated on December 31, 1937.

The net surplus of revenue over expenditure for the year amounted to £4,068 11s. 11d., after making provision for all known expenses.

The sum of £2,922 18s. 10d. has been written off for depreciation of the building (British Medical Association House), office furniture and equipment and the Library.

A sum of £200 has been provided out of the current year's revenue to create a reserve for painting the exterior of the building. This amount, for the time being, is used in the business of the Association.

FINANCIAL STATEMENTS.

Dr. George Bell moved that the statement of receipts and expenditure be received. The motion was seconded by Dr. W. Vickers and carried. The statements are

published herewith. Dr. Bell also dealt with the balance sheet and financial statement of the premises account. Dr. Vickers seconded Dr. Bell's motion that the statements be received and the motion was carried.

ELECTION OF OFFICE-BEARERS.

Dr. Dey announced that the following had been elected members of the council for the ensuing year: Dr. G. M. Barron, Dr. George Bell, Sir Charles Blackburn, Dr. K. S. M. Brown, Dr. A. J. Collins, Dr. A. M. Davidson, Dr. H. R. R. Grieve, Dr. P. L. Hipsley, Professor W. K. Inglis, Dr. A. A. Palmer, Dr. W. F. Simmons, Dr. E. H. M. Stephen, Dr. A. C. Thomas, Dr. E. A. Tivey, Dr. R. C. Traill, Dr. W. Vickers, Dr. A. S. Walker, Dr. G. C. Willcocks. Messrs. F. W. Duesbury and Company were appointed auditors for the ensuing year.

On the motion of Dr. A. S. Walker, seconded by Dr. A. J. Gibson, Dr. L. A. Dey was appointed representative and Dr. H. C. Rutherford Darling deputy representative of the Branch on the Representative Body, 1938-1939.

NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.**Balance Sheet as at December 31, 1937.**

FIXED LIABILITIES.					FIXED ASSETS.				
	£	s.	d.	£	s.	d.	£	s.	d.
Debentures—									
239 4% Series "A" at £10 each	2,390	0	0						
431 4-65% Series "B" at £50 each	21,550	0	0						
246 4-65% Series "C" at £10 each	2,460	0	0						
	26,400	0	0						
Less Amount Unpaid	62	0	0						
	26,338	0	0						
Australian Mutual Provident Society (Secured by mortgage over property—B.M.A. House)	93,000	0	0	119,338	0	0			
TOTAL FIXED LIABILITIES				119,338	0	0			
CURRENT LIABILITIES.					CURRENT ASSETS.				
Sundry Creditors	382	17	5		Sundry Debtors—(after making provision for doubtful debts)—				
Interest Accrued on Debentures	1,229	12	6		Sundry Tenants for Rent, etc.	2,533	11	2	
Interest Accrued on Mortgage	348	15	0		Sundry Accounts	0	12	9	
Deposit at Call	700	0	0						
Subscriptions Paid in Advance	54	17	3	2,716	2	2	2,534	3	11
					Commercial Banking Company of Sydney Limited—				
ACCUMULATED FUNDS.					Premises and Branch Current Accounts	576	2	9	
Balance at 31st December, 1936	59,862	0	11		Debenture Interest Account	20	8	0	
Add Surplus for year ended 31st December, 1937:					Fixed Deposits	3,000	0	0	
Branch Account, £1,178	3	0			Cash on Hand	9	12	5	
Premises Account 2,890	8	11							
	4,068	11	11		Prepaid Insurance Rates, etc.				
	63,930	12	10						
Provision for Painting of Building	400	0	0	64,330	12	10	3,606	3	2
				£186,384	15	0	622	1	11
							£186,384	15	0

We have examined the foregoing Balance Sheet with the Books of Account of the New South Wales Branch of the British Medical Association, and, having obtained all the information and explanations we have required, we are of the opinion that such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Company's affairs according to the best of our information and the explanations given to us and as shown by the Books of the Company. In our opinion the Register of Members and other records which the Company is required to keep by law or by its Articles have been properly kept.

London Bank Chambers,
18-20 Martin Place, Sydney.
Sydney, 18th January, 1938.

F. W. DUESBURY & COY.,
Chartered Accountants (Aust.).

LINDSAY DEY, President.
GEORGE BELL, Hon. Treasurer.
R. J. STIFFE, F.C.A. (Aust.), Financial Secretary.

BRANCH ACCOUNT.

Income and Expenditure Account for the Year Ended December 31, 1937.

December 31, 1937.	£	s.	d.	£	s.	d.
To Salaries	1,661	16	6			
" Rent—Offices, etc.	1,000	0	0			
" Printing and Stationery .. .	269	7	2			
" Stamps and Telegrams .. .	229	2	5			
" Telephones	82	9	11			
" Legal Expenses	10	10	0			
" Travelling Expenses	55	7	6			
" Insurance	6	4	1			
" Exchange and Bank Charges ..	7	1	6			
" Refreshments—meetings .. .	13	13	4			
" Newspapers	3	19	5			
" Sundry Petty Expenses .. .	33	6	8			
" Gratuity	60	0	0			
" Tea money	13	10	0			
" University Club Luncheon .. .	4	18	0			
" Coronation Decorations .. .	11	15	0			
				3,463	1	6
" Allowance for Depreciation of—						
Library	95	10	2			
Office Furniture and Equipment ..	27	8	8			
				122	18	10
" Balance, being surplus for the year ended 31st December, 1937, transferred to Accumulated Funds Account .. .				1,178	3	0
				£4,764	3	4

December 31, 1937.	£	s.	d.	£	s.	d.
By Subscriptions received—						
1937	8,109	17	6			
1936	476	11	2			
Previous years	67	4	0			
				8,653	12	8
Less Proportion due to—						
British Medical Association	2,240	14	10			
THE MEDICAL JOURNAL OF AUSTRALIA	1,747	15	0			
				3,988	9	10
				4,665	2	10
" Interest	4	0	0			
" Rent, Assembly Hall	86	15	0			
" Sales—Common Form of Agreement, etc.	8	5	6			
				99	0	6
				£4,764	3	4

On the motion of Dr. George Bell, seconded by Dr. W. F. Simmons, Dr. H. C. Rutherford Darling and Dr. A. Muscio were appointed delegates to attend the 106th annual meeting of the Association to be held at Plymouth, July 19 to 22, 1938.

Dr. L. A. Dey moved:

That Dr. C. H. E. Lawes, a member of the council since 16th September, 1913, President 1923-24, Honorary Secretary 1931-37 and Representative of the Branch on the Federal Committee 1932-33, be elected a Vice-President of the Association.

The motion was seconded by Dr. A. A. Palmer and carried unanimously.

INCOMING PRESIDENT'S ADDRESS.

Dr. B. T. Edye delivered his President's address (see page 721). A vote of thanks was passed to Dr. Edye, on the motion of Dr. E. H. M. Stephen, seconded by Dr. K. S. M. Brown.

INDUCTION OF PRESIDENT.

Dr. L. A. Dey inducted the President for the year 1938-1939 (Dr. B. T. Edye). Dr. Edye thanked the members for his election.

NOMINATIONS AND ELECTIONS.

THE undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Heard, Kenneth Harold, M.B., B.S., 1936 (Univ. Adelaide), Box 23, Omeo, Victoria.

The undermentioned has applied for election as a member of the South Australian Branch of the British Medical Association:

Pellew, Leonard James Ternouth, M.B., B.S., 1932 (Univ. Adelaide), F.R.C.S., 1936, Hutt Street, Adelaide.

The undermentioned have been elected members of the South Australian Branch of the British Medical Association:

Formby, Richard Harper, M.B., B.S., 1937 (Univ. Adelaide), Strathalbyn.
Turner, Frederick Gordon Trevor, M.B., B.S., 1936 (Univ. Melbourne), 98, Unley Road, North Unley.
Verco, Geoffrey Webb, M.B., B.S., 1937 (Univ. Adelaide), Adelaide Hospital, Adelaide.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Abbott, Terence Kingsmill, M.B., B.S., 1938 (Univ. Sydney), Sydney Hospital, Sydney.
Banks, John Matthew, M.B., B.S., 1938 (Univ. Sydney), Sydney Hospital, Sydney.
Bonar, Francis Stephen, M.B., B.S., 1937 (Univ. Sydney), Royal Alexandra Hospital, Camperdown.
Corlette, Ewan Lawrie, M.B., B.S., 1931 (Univ. Sydney), Kite and Anson Streets, Orange.
Dicks, Harold Griffiths, M.B., B.S., 1938 (Univ. Sydney), Sydney Hospital, Sydney.
Melville, Robert Pope, M.B., B.S., 1938 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Morson, Stuart MacKenzie, M.B., B.S., 1938 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Young, Gordon Neville, M.B., B.S., 1936 (Univ. Sydney), Royal Alexandra Hospital for Children, Camperdown.

Medical Societies.

MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held at the Children's Hospital, Carlton, Melbourne, on October 13, 1937, Dr. ROBERT SOUTHBY, the President, in the chair.

The meeting took the form of a number of clinical demonstrations by members of the society. Part of this report appeared in the issue of April 9, 1938.

Congenital Obliteration of the Bile Ducts.

DR. J. W. GRIEVE showed a baby, aged seven weeks, with congenital obliteration of the bile ducts. He said that jaundice had been noticed on the second day of the child's life, and though it had fluctuated in depth the jaundice had persisted. The urine had been highly coloured, and the faeces pale and fatty throughout. The abdomen had become rather distended from the age of five weeks. In other respects the infant had seemed well and was gaining weight slowly. The birth had been normal and the umbilical cord had separated cleanly. The father and mother were healthy and had not had any serious illness. They had three healthy children; but one male infant had died of malnutrition when only a few weeks old, soon after his admission to the Children's Hospital approximately three years before the meeting. The baby shown by Dr. Grieve was vigorous and well nourished, with obvious icterus of the skin and conjunctivae. The liver was firm and smooth, but grossly enlarged, the lower edge reaching to the level of the umbilicus. The spleen was not palpable, and no haemorrhages had occurred. The qualitative Van den Bergh test had yielded an immediate direct reaction, and the response to the Fouchet test was positive; the quantitative Van den Bergh estimation amounted to 10.5 units of bilirubin. The weight of the baby was seven and three-quarter pounds, and she had gained six ounces in weight during the week she had been in hospital; she was being fed on a sweetened mixture of three ounces of topped milk and two ounces of water every four hours, and to each feeding was added a little purified bile salts. Dr. Grieve said he had shown the baby with the object of receiving advice about the feasibility of surgical intervention.

DR. W. FORSTER said that unless the surgeon knew that the duct was patent it was no good attempting to make an anastomosis, and he suggested a radiographical investigation.

DR. D. O. BROWN said that the extent of biliary stenosis varied and that there had been some fantastic suggestions made in the literature, such as attempted anastomosis of the surface of the liver to the duodenum. If there was a gall-bladder, it might occasionally be practicable to perform a cholecysto-gastrostomy successfully; but the outcome of any operative procedure would probably be disappointing.

DR. C. MACDONALD considered that a cholecystogram would not serve any useful purpose, because in obstructive jaundice the gall-bladder was not outlined, and the failure to secure an outline could not be interpreted as due to absence of the gall-bladder.

DR. R. WEBSTER said that in at least half of the patients of this type who came to autopsy the gall-bladder was empty; the stenosis frequently involved the hepatic ducts, and cirrhosis of the liver was usually present to such a degree that it had to be inferred that the process had commenced *in utero*. The liver of the patient shown felt hard, and the hardness was not due to tension alone.

Dr. Grieve added that he was in agreement with what had been said, but as the end was inevitable without surgical investigation, he thought it would be worth while to ask a surgeon to perform an exploratory operation.

Exophthalmic Goitre.

DR. V. COLLINS, at the request of Dr. D. EMBELTON, showed a girl, aged nine and a half years, suffering from exophthalmic goitre, who had been admitted to the hospital on September 3, 1937. She was an only child and had been taken to a doctor two months before her admission to hospital on account of protrusion of the eyes and a swelling in the neck. She had been subject to vomiting attacks, which had not been cured by appendicectomy performed two years before the meeting. At the operation appendicitis with peritonitis was found, but the vomiting

had persisted, though less frequently and less severely. The mother had stated at the time the child was admitted to hospital, in September, 1937, that for six months the child had been more difficult to manage than hitherto; she had become more wilful and less amenable to reasoning. She had always been an active child and had remained in good health; for three or four months the eyes had been becoming prominent, though the proptosis had varied in degree from time to time and had seemed to be decreasing while the child was resting in bed at her home prior to admission to hospital. During the same period the swelling in the neck had been noticed, at first on the right side, but later it had involved the whole of the thyroid gland. In December, 1936, the patient's hair had begun to fall out, and for this reason it had been cut short. The appetite had always been satisfactory, but recently she had seemed ravenous and had eaten much more in the past few months than was usual with her. She had filled out considerably, especially in the limbs; but the mother had been unable to state any actual weights.

On her admission to hospital she weighed 79 pounds, and had gained one pound during the next month. The subcutaneous fat deposits were firm and lobulated, particularly in the epigastrium, as in obese adults or in children suffering from dyspituitarism. In bed she had been placid in temperament. Exophthalmos was present, with some "lagging" of the upper lids when she was looking down, and firm, smooth enlargement of the thyroid gland was noticed, affecting the right side more than the left. The systolic blood pressure was 118 to 122 millimetres of mercury the diastolic 70 to 72. No definite tremor of the hands had been detected while she was in hospital. Shortly after her admission to the ward the basal metabolic rate was found to be -31%, but when the estimation was repeated on October 11 the estimate was +6%. The pulse rates recorded had varied between 90 and 110 beats per minute, but the sleeping pulse rate had been constantly about 80 beats per minute. Radiographically it had been demonstrated that the size and shape of the pituitary fossa were within normal limits.

Dr. Collins expressed the opinion that no appreciable change in the appearances of the eyes or of the thyroid gland had been apparent while the child was under observation. He stated that she had at first been treated merely by rest in bed and had slept well and been placid when awake; but after two weeks treatment with Lugol's solution was commenced and the dose had reached nine minims daily. He invited discussion on the possible relationship of accident or the abdominal operation to the signs of hyperthyroidism, on the unusual association of some of the signs of hypopituitarism, and on the desirability of operative or continued medical treatment.

DR. KATE CAMPBELL said that she had seen the patient in January or in February, 1937, and had found definite evidence of toxic goitre then. The child had been sharp and alert when younger, and had become almost myxoedematous looking. She had attributed the onset to psychological stresses, because she knew that the mother was melancholic to a pathological degree, and this must have clouded the child's home life.

DR. J. W. GRIEVE referred to the summary of the patients suffering from exophthalmic goitre who had been in-patients at the hospital recently, which had been presented at a previous meeting of the society by Dr. Collins, and drew attention to four generalizations: (i) the lack of tremor in the majority of patients; (ii) the fidgety movements, which had led in some instances to the provisional diagnosis of chorea; (iii) the low basal metabolic rate shown by the majority by the time they had been admitted to hospital, and their later tendency to subthyroidism; and (iv) the usual mildness of the condition and the fact that it had responded well to medicinal treatment and had not required operative treatment.

DR. J. G. WHITAKER said that a month before the meeting he had performed subtotal thyroidectomy on a girl, aged thirteen years, who had not menstruated and had not

responded to medical treatment over a trial period of six months. In this patient the systolic blood pressure had reached 160 millimetres of mercury, the basal metabolic rate was +60%, and the pulse rate was 130 beats per minute. He quoted this example to illustrate that on some occasions operative treatment was indicated.

Dr. M. KENT HUGHES drew attention to the dosage of Lugol's solution. Several authorities had advised minute quantities, such as one or two minims daily, as sufficient to bring about beneficial results, and had coupled this advice with the warning that larger quantities were liable to accelerate the pathological condition.

Dr. T. LOWE said that while he was in London he had seen the results of medicinal treatment with very small dosage, and in mild cases, reviewed after six, nine and twelve months of this method of treatment, definite improvement had been manifested. He had also seen two girls with evidences of adolescent toxicosis undergoing treatment at Toronto, and from inquiries he had made there he had learned that the physicians in that city treated the patients with iodine and rest in bed and had no desire to have thyroidectomy performed, though sometimes deep X ray therapy was used.

Dr. S. WILLIAMS said that he had noticed in the literature emanating from the United States of America a strong tendency towards operative treatment; Crile, of Cleveland, for example, was in the habit of performing partial thyroidectomy on the children. He obtained favourable results. Increasing exophthalmos was one of the chief indications for operation.

Dr. R. SOUTHEY referred to a summary in a recent number of *Archives of Pediatrics*, dealing with 128 patients. He quoted the final observation that treatment should be conservative, as the child would need the whole of the thyroid gland for normal development.

Dr. COLLINS, in conclusion, said that there had been seven other patients with toxic goitre in the hospital since 1920. All had been referred to in the notes as nervous children, and exophthalmos and goitre had been present constantly in the series. The youngest patient was over nine years of age, and five were thirteen years of age. Two out of three girls, thirteen years of age, had menstruated. One of the series was a fat child, similar in many respects to the patient he had shown that night. The boy shown at the previous meeting had had a basal metabolic rate of +50%; in two cases the rate was not recorded; three girls had had basal metabolic rates which were low, being -5%, nil and -10% respectively. It had interested him to note that in the American series the patients had been younger. As a result of his special interest in the subject he had concluded that medical treatment was worth while and that the children made satisfactory recoveries; it should be persisted with for a good while before anything surgical was contemplated; the present patient was quite well except for the exophthalmos, and would be kept under observation and treatment.

Displaced Capital Femoral Epiphysis.

Dr. E. E. DUNLOP, at the request of Dr. H. D. STEPHENS, showed a boy, aged thirteen and a half years, who had been admitted to the Children's Hospital seven weeks earlier, with the history of progressive pain and disability in the left hip joint of three weeks' duration. Though he had played football and other games prior to the onset, he could not recall any specific injury. His health had been excellent, and the family history was quite satisfactory. Dr. Dunlop said that the condition had been regarded as infective arthritis. The boy was plump but flabby, with rather under-developed testes, and had a baby face, conforming to the Fröhlich type of dyspituitarism. He was not febrile, had an excellent appetite, and, apart from the hip, no abnormality was found on general examination. The left hip was definitely deformed, with external rotation and shortening of the limb amounting to 1.875 centimetres (three-quarters of an inch). The base of Bryant's triangle was also shortened

1.875 centimetres (three-quarters of an inch), and the trochanter was obviously elevated. All movements were painful, and it seemed possible that the neck of the femur was fractured. Skiagraphically it was ascertained that the pituitary fossa was rather small, that the left capital femoral epiphysis had slipped, and that the other epiphyses of the lower limbs were normal in appearance. The blood serum had failed to yield a reaction to the Wassermann test; the blood calcium was 11.8 milligrammes and the blood phosphorus 3.5 milligrammes per hundred cubic centimetres.

Dr. Dunlop said that the treatment had been by means of skeletal traction for six weeks applied on a double Thomas splint with extension and moderate abduction (eighteen inches between the feet), and a Kirschner wire had been inserted through the tibial tuberosity. Strong internal rotation had been maintained by a pull of one and a half pounds to the lateral side of the horseshoe. The extension weight used for the first two days was 25 pounds, but was then reduced to 12 pounds and later still to six pounds. After traction for six weeks the limb was encased in a plaster spica, without abduction but with maintenance of the internal rotation.

Dr. Dunlop stated that in the past five years only four patients had been admitted to the hospital on account of slipped capital femoral epiphysis, and he thought it might be of interest if he reviewed some of the points of interest in connexion with the aetiology and treatment of the condition as a stimulus to further discussion. In 1926 Key had summarized the three main views of the aetiology. The first was trauma. Older writers had written of "traumatic *cora vara*". A history of trauma was obtained in approximately 50% of cases. It was claimed that moderate trauma might exert an effect by inducing hyperæmic states which, according to the views of Leriche and Policord, favoured rarefaction of bone. The second view was the simple static view. The condition followed on a disproportion of the weight of the child to the strength of the bone in the epiphyseal region. The epiphyseal line came to lie more vertically after the age of ten years, and the periosteum was said to become thinner about the neck of the bone during the adolescent period. The third view was the view of organic disease. Rickets was blamed by some writers and infection by others. Dr. Dunlop went on to say that Kienboch and others had stressed the importance of pituitary dysfunction as an aetiological factor. It might act by weakening the bony skeleton or by causing an increase in weight.

Dr. Dunlop classified the cases for treatment into four groups, placing the case of the patient he had shown that night in the first group. The four groups were: (i) acute early separation, (ii) cases of some months' standing, but with an obvious line of demarcation still present between the head and the neck, (iii) the young adult in whom the condition had healed, and (iv) the older patient with arthritis.

Speaking of treatment of the present patient, Dr. Dunlop thought that the main interest of the discussion hinged on the value of traction as opposed to manipulation to effect reduction. In addition to these non-operative procedures, Wilson particularly had recommended operative treatment. Until recent years the method of reduction usually adopted was manipulation along lines similar to the well-known Whitman technique for fractured femoral neck. The results had been far from good and, for instance, Key in 1926 had stated that the end results in untreated patients were on the whole better than those in the treated patients. Ghass in 1931 had introduced a modification of the Whitman technique for manipulation. He had stressed the difference in the displacement with epiphyseal separation and fractures of the neck of the femur. In the former the epiphysis was displaced downwards and backwards, and the neck of the femur was displaced upward, outward and forward, whereas in fractured femoral neck the proximal fragment remained in the normal position and the distal one was displaced upward, outward and backward. The manœuvre advocated by Ghass consisted of abduction, internal rotation and flexion instead of exten-

sion (as in Whitman's method) at the hip joint. This manœuvre was said to give improved results.

Dr. Dunlop went on to say that Wardle, in 1933, had strongly advocated traction with the leg in the adducted position and internally rotated. He employed fixed traction on a frame, and strongly criticized manipulation on the grounds that the projecting edge of the neck was forced against the surface of the head, tending to force it down and back and inflicting damage to the joint structures which might possibly cause arthritis and poor subsequent function. Ellis in 1935, in *The Lancet*, had first advocated a method approximating to the one that had been employed in the patient Dr. Dunlop had shown that night. Ellis used skeletal traction with the leg abducted and internally rotated, and claimed good reduction and subsequent good function in all cases with a history of not more than six weeks' duration. The patient Dr. Dunlop had shown thus presented for discussion the consideration of the place of skeletal traction in treatment, and Dr. Dunlop would welcome suggestions as to the further treatment and opinions concerning prognosis.

Dr. C. MACDONALD complained about a want of precision in terminology that radiologists encountered in connexion with the radiological anomalies associated with various syndromes of dysplasticism, and in particular deprecated eponymic nomenclature for syndromes that did not comply in all particulars with the syndromes originally described by the persons whose names were used. He asked for information concerning a statement that he had seen, that there was always a piece of metaphysis attached to the slipped epiphysis. He also had formed the impression that there was an element of osteochondral dystrophy in the etiology, as by no means all of the children affected were fat and heavy; the bony architecture was disordered on account of the osteochondral dystrophy paving the way to slipping of the epiphysis. This occurred because of disproportion in weight or for some other reason.

Dr. J. B. COLQUHOUN said that Wilson, of New York, had written a paper on the subject under discussion, in which he had made a division of a series of patients into three main groups. They were: first, the type with *dystrophia adiposo-genitalis*, consisting of 65% to 70% of the patients; secondly, the thin type, known as the "Uncle Sam" type, approximating 20% of the patients, and some of them showing evidences of dysplasticism; and thirdly, a nondescript type, which could not be placed in either of the other groups. Dr. Colquhoun said that three main pathological periods could be identified in the transition from the normal hip to the fully established lesion. First came the pre-slipping stage, in which there was some pain or muscle spasm on manipulation; in this stage the patient should be placed at rest in bed. Next came the slipping stage; and thirdly came the stage of slipped capital epiphysis. He said that Walter Legge had published the history of a boy who had had a slipped epiphysis which had been ascribed to tripping when going up some steps; a year later similar symptoms had commenced on the opposite side and the patient had been placed at rest in bed for six months; further slipping of the epiphysis had not occurred. Wilson had been unsuccessful with the Royal Whitman manœuvre and had expressed preference for the Leadbetter manœuvre, which had been advocated by Leadbetter for the reduction of fractures of the neck of the femur.

Dr. H. D. STEPHENS commented on the clinical variants that were included under the Fröhlich type of dysplasticism, and stated that in most patients with slipped capital epiphysis who had been under his care there had been a history of trauma, usually of a mild nature, and many had had small areas of osteochondrosis. The spur on the neck of the metaphysis holding the head of the bone was in some cases developed as a separate epiphysis, and this epiphysis might take on osteochondritic trouble. Brailsford had said that there was a pre-clinical period, a "woolly" epiphyseal line. The retinacular fibres were strong and not atrophic in children between twelve and seventeen years of age. The late Hamilton Russell used to place the limb in extension by means of his system of

parallelogram extension apparatus, and by way of after-treatment it was the practice to keep the limbs in plaster for three months. The next problem was that of keeping them from bearing weight afterwards. Dr. Stephens was rather afraid of the Thomas caliper splint for this purpose; though it should take the weight on the *tuber ischiadicum*, in his experience this was often not done efficiently. He preferred a modified plaster with patten and crutches or, alternatively, patten and crutches alone.

Analytical Department.

"HOSPITAL" BARLEY SUGAR.

"HOSPITAL" BARLEY SUGAR is produced by Sydney Confectionery, Proprietary, Limited. It is said to contain 50% of glucose. A sample was submitted to our analysts for their opinion. Their report is as follows:

The accurate determination of glucose in barley sugar is rendered difficult by the fact that *Glucosum Liquidum*, B.P., has no definitely defined composition. It is stated that it is a mixture of dextrose, maltose, dextrin and water; but the relative proportions are not specified. The proportions are in fact known to be variable. It may be assumed, however, that the normal liquid glucose produced in Australia has the following average characteristics:

Water	18%
Total solids	82%
Reducing sugars, calculated as dextrose, as determined by copper reduction method	40%
Apparent dextrose content, as determined by alkali-iodine method	36%

On analysis of the sample of barley sugar forwarded by you the following results were obtained:

Reducing sugars calculated as dextrose	21.00%
Apparent dextrose by alkali-iodine method	19.64%

The indicated proportions of anhydrous glucose solids and of liquid glucose in the barley sugar are therefore:

	Anhydrous Glucose Solids.	Liquid Glucose.
By calculation from reducing sugars	43.05%	52.5%
By calculation from dextrose by alkali-iodine method	44.77%	54.6%

These figures were checked by polarization at 87° C. of an inverted half-normal solution of the barley sugar. The result obtained, using a 100-millimetre tube, was 22.28° V, which indicates 45.5% of anhydrous glucose solids polarizing at 211° V in a 200-millimetre tube. This latter method of determining glucose is an official method of the Association of Official Agricultural Chemists of America, and the result obtained (45.5%) is in substantial agreement with those given previously.

In our opinion the manufacturers of the barley sugar have employed in the preparation of the confection not less than 50% of liquid glucose; but in the finished article the proportion of anhydrous glucose solids is slightly below 50%.

From this report it is apparent that the manufacturers of "Hospital" barley sugar make no extravagant claims for their product. It is a palatable confection, attractive in appearance, and can be recommended with confidence for conditions in which the use of glucose in such a form is considered desirable.

Correspondence.

WAGES TAX AND A LOCUM TENENS.

SIR: The Secretary of the British Medical Agency of New South Wales Limited has suggested that I should write, for publication in the journal, a letter giving particulars of a recent experience with the Taxation Department.

I have not been in the habit of deducting wages tax when paying my *locum tenens*, believing, as apparently the majority of other practitioners do, that they would submit their own income tax returns and pay special income tax as assessed on those returns. A few months ago a very kind and courteous gentleman from the Taxation Department called on me and went through my returns for the previous seven years. He was, as I have said, very kind and courteous; nevertheless I had to pay wages tax for every *locum tenens* that I have employed in the last seven years.

I understand the present rate works out at 8s. 7d. per week for the usual £10 10s. per week wage.

Yours, etc.,

"STUNG."

March 30, 1938.

EXCISION OF THE PATELLA.

SIR: Mr. H. Jackson Burrows, in *The British Medical Journal*, February 19, 1938, referred to Mr. Ralph Brookes's published account of the results of excision of the fractured patella and in a serious note "written as a matter of urgency, in the hope that surgeons contemplating removal of the patella for recurrent dislocation will be dissuaded..." virtually forbade this procedure for recurrent dislocations. Last week, at the annual meeting of the Australian Orthopaedic Association, I read a paper on the subject ("Indications for and Results of Removal of the Patella") and recommended patellar removal for fractures with separation, always in very comminuted fractures, refracture, malunion, especially with osteoarthritis, non-union, and also particularly for recurrent dislocation of the patella.

Although Mr. Burrows has seen two cases of "recurrent dislocation of the extensor apparatus continued after operation" I cannot understand what he means by this phrase, unless the oval aperture in the quadriceps expansion was not closed after the removal of the patella and then became impaled on the external femoral condyle on flexion of the knee. My own experience of removal of the patella for recurrent dislocation is not large, at present, and equals his; but the conclusions are absolutely contrary. I have removed the patella four times for recurrent dislocation, and two of the completed cases have been observed for eight months. The functional and cosmetic results are perfect, and I anticipate the same result with the other two more recent cases.

Removal of the patella was forced upon me in two cases of recurrent dislocation. In one case two previous operations by me, which included Krogus's semitendinosus transplant, kangaroo tendon between *ligamentum patellae* and internal lateral ligament, transference of the bony insertion of *ligamentum patellae* distally and medially, had failed. On removal of the patella in this case the cartilaginous articular surface of the patella was replaced by a thick proliferative villous synovial growth, which could only be effectively photographed with the patella submerged in water. It may be said that I did not perform the orthodox operations correctly; but a survey of the numerous reports in recent years and the multiplicity of operations described for it (which rival in number those for *hallux valgus*) shows that the treatment of this con-

dition is not in every case satisfactory. McMurray, in his recent book, states that in cases where traumatic osteoarthritis or failure of previous operation has occurred because "slipping still occurs", the knee joint should be arthrodesed. Surely it would be simpler and more advisable to remove the offending and irritating patella. In view of my present experience I intend removing the patella for recurrent dislocation, thereby solving a troublesome problem, unless in the light of further experience I am convinced it is wrong.

Yours, etc.,

THOMAS KING.

2, Collins Street,
Melbourne, C.I.,
April 2, 1938.

HYPERTROPHY OF THE PROSTATE.

SIR: René Le Fur, who wrote Volume XXII of a French treatise of medicine published under the direction of Gilbert and Carnot, states:

The clinic confirms the proofs given by the laboratory and we know that hypertrophy of the prostate (a vague mongrel expression which ought to disappear from medical nomenclature) is only the termination of a great number of various pathological states, of which the most important from the pathogenic point of view is chronic glandular inflammation, otherwise known as chronic prostatitis.

When this last mentioned—persisting for many years—evolves on a favourable soil, it becomes, after a certain age, the prostatitis of advancing years, which is only the ultimate evolution in certain particular conditions of the chronic prostatitis of the adult.

What we should know is that for a long time all the accidents of prostatism are curable in a very simple manner.

Yours, etc.,

J. MORRIS ROE.

Victory Chambers,
Queen Street,
Brisbane.
April 5, 1938.

Books Received.

MYOCARDITIS: THE ST. CYRES MEMORIAL LECTURES, by J. S. Goodall, F.R.C.S., F.R.S., K. F. Wenckebach, M.D., F.R.C.P., R. O. Moon, M.D., F.R.C.P., J. Cowan, M.D., D.Sc., F.R.F.P.S., and J. Hay, M.D., F.R.C.P., D.L.; 1937. London: Eyre and Spottiswoode Limited. Demy 8vo, pp. 152, with illustrations. Price: 10s. 6d. net.

LEAGUE OF NATIONS PUBLICATIONS. BULLETIN OF THE HEALTH ORGANIZATION, Volume VI, Number 6, December, 1937. Geneva: League of Nations Publications Department. Medium 8vo, pp. 258. Price: 2s. 6d. net.

HANDBOOK OF PRACTICAL BACTERIOLOGY: A GUIDE TO BACTERIOLOGICAL LABORATORY WORK, by T. J. Mackie, M.D., D.P.H., and J. E. McCartney, M.D., D.Sc.; Fifth Edition; 1938. Edinburgh: E. and S. Livingstone. Crown 8vo, pp. 597, with illustrations. Price: 12s. 6d. net.

RECENT ADVANCES IN PATHOLOGY, by G. Haddfield, M.D., F.R.C.P., and L. P. Garrod, M.A., M.D., B.Ch., F.R.C.P.; Third Edition; 1938. London: J. and A. Churchill Limited. Large crown 8vo, pp. 432, with 65 illustrations. Price: 15s. net.

SURFACE AND RADIOLOGICAL ANATOMY FOR STUDENTS AND GENERAL PRACTITIONERS, by A. B. Appleton, M.A., M.D., W. J. Hamilton, M.D., B.Ch., D.Sc., F.R.S.E., and I. C. C. Tchaperoff, M.A., M.D., B.Ch., D.M.R.E.; 1938. Cambridge: W. Heffer and Sons Limited. Double crown 9mo, pp. 322, with illustrations, of which many are in colour. Price: 15s. net.

THE INFANT: A HANDBOOK OF MODERN TREATMENT, by E. Pritchard, M.A., M.D., F.R.C.P.; 1938. London: Edward Arnold and Company; Australia: Angus and Robertson Limited. Demy 8vo, pp. 755, with illustrations. Price: 27s. net.

DISEASES OF WOMEN, by Ten Teachers, under the direction of C. White, M.D., B.S., F.R.C.P., F.R.C.S., F.C.O.G.; edited by Sir Comyns Berkeley, C. White and F. Cook; Sixth Edition; 1938. London: Edward Arnold and Company; Australia: Angus and Robertson Limited. Medium 8vo, pp. 604, with illustrations. Price: 27s. net.

Diary for the Month.

APR. 27.—Victorian Branch, B.M.A.: Council.
 APR. 26.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 APR. 28.—South Australian Branch, B.M.A.: Branch.
 APR. 28.—New South Wales Branch, B.M.A.: Branch.
 MAY 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 MAY 4.—Victorian Branch, B.M.A.: Branch.
 MAY 4.—Western Australian Branch, B.M.A.: Council.
 MAY 5.—South Australian Branch, B.M.A.: Council.
 MAY 6.—Queensland Branch, B.M.A.: Branch.
 MAY 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 MAY 13.—Queensland Branch, B.M.A.: Council.
 MAY 17.—New South Wales Branch, B.M.A.: Ethics Committee.
 MAY 18.—Western Australian Branch, B.M.A.: Branch.
 MAY 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
 MAY 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 MAY 25.—Victorian Branch, B.M.A.: Council.
 MAY 26.—New South Wales Branch, B.M.A.: Branch.
 MAY 26.—South Australian Branch, B.M.A.: Branch.
 MAY 27.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. F. H. Ebell has been appointed, under the provisions of *The Health Act, 1911-1937*, of Western Australia, Medical Officer of Health to the Mount Magnet District Road Board.

Dr. G. J. Cuthbert has been appointed Director of Maternal and Baby Welfare in the Office of the Director-General of Public Health of New South Wales.

Dr. A. J. Geoffroy and Dr. S. H. Hankins have been appointed Medical Officers in the Office of the Director-General of Public Health of New South Wales.

Dr. W. K. Collins has been appointed Medical Officer of Health to the Preston Road Board, under the provisions of *The Health Act, 1911-1937*, of Western Australia.

Dr. G. L. Myles has been appointed Medical Officer of Health to the Mount Margaret Road Board, in accordance with the provisions of *The Health Act, 1911-1937*, of Western Australia.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xvi-xviii.

AUSTIN HOSPITAL FOR CANCER AND CHRONIC DISEASES, HEIDELBERG, VICTORIA: Honorary Officers.

COMMONWEALTH SERUM LABORATORIES, MELBOURNE, VICTORIA: Medical Officer.

MATER MISERICORDIÆ PUBLIC HOSPITALS, BRISBANE, QUEENSLAND: Honorary Officers.

TAMBO HOSPITALS BOARD, TAMBO, QUEENSLAND: Medical Superintendent.

THE PRINCE HENRY HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers.

THE UNIVERSITY OF SYDNEY, NEW SOUTH WALES: Post-Graduate Lectureships in Anaesthetics.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 235, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

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All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2551-2.)

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